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Hunterian Lecture
ON
TESTICULAR GRAFTS.

Delivered before the Royal College of Surgeons of England on Feb. 4th, 1924,

BY KENNETH M. WALKER, F.R.C.S. ENG.,
SURGEON IN CHARGE OF GENITO-URINARY DEPARTMENTS, ROYAL NORTHERN HOSPITAL AND MILLER GENERAL HOSPITAL FOR S.E. LONDON.

IT is the custom as a prelude to the delivery of one of these lectures to trace some link between the subject chosen for discussion and the work of the illustrious man whose name the lecture serves to commemorate. On the present occasion this connexion is particularly intimate, for it is recorded that in 1780 John Hunter succeeded in the task of transplanting the testicle of a dog. Although the full import of this experiment does not appear to have been realised at the time, the fact that transplantation had been achieved may well have acted as an inspiration to Berthold and other pioneers of grafting in the work that they carried out nearly a century later. It will be seen, therefore, that the subject of testicular grafts that I have chosen for my present lecture is singularly appropriate. Before, however, proceeding to my main theme it will be convenient to say a few words on the subject of treatment by means of testicular extracts.

TESTICULAR EXTRACTS.

Brown-Séquard was the first to call attention to the use of extracts of animals' testicles as a therapeutic agent. His experiments were conducted on his own person and consisted of injecting subcutaneously a freshly prepared extract of the testicle of the dog. He claimed that as the result of these injections a definite improvement in his health was brought about, accompanied by a great increase in muscular and mental energy. Indeed, so marked was the effect that he was enabled, after having abandoned his researches on account of failing health, to return to his laboratory, and to remain there hard at work up to the time of his death at an advanced age.

Since the time of Brown-Séquard testicular extracts have been extensively employed in clinical medicine, although observations on the subject of a scientific or exact nature are remarkably few. Zoth and Pregl have proved that subcutaneous injections of orchitic extract do not of themselves produce an increased capacity for muscular effort, but that when the injections are combined with muscular exercises ergograph records show an increase of as much as 50 per cent. in efficiency. However, that the injections are not entirely free from danger has been demonstrated by Loisel, who found that the ovaries and testicles of fishes, frogs, birds, and mammals all contained toxic substances which, when injected subcutaneously, may provoke serious symptoms or even death. On account of this, Brown-Séquard's methods of subcutaneous injections have to a great extent been abandoned in favour of oral administration.

A great number of commercial preparations of orchitic extracts are at present on the market. My own observations have, in the main, been made with a special extract prepared at the Lister Institute from fresh bull's testicles. This extract has been used on a large scale at St. Mary Abbots Hospital, Kensington, and through the courtesy of Drs. V. Korenchevsky and J. A. Lumsden Cook, I have been allowed to examine some of the patients under treatment. Accurate records have been kept throughout the course of treatment, and certain simple psychological tests of memory, attention, and fatigue carried out by an observer trained in these methods. As the result of what I have seen, and of my own previous experience, I have come to the conclusion that extracts of testicle, when administered by the mouth, are entirely without effect. It is true that in a certain number of cases an improvement in general health or in mental energy has been claimed after taking the extract, but in none of these cases have I been able to convince myself that this was not the result of mental suggestion. I am strongly of the opinion that the active principle of testicular extract, whatever it may be, is destroyed by the digestive juices, and that the only hope of obtaining results is by the use of subcutaneous injections. Pariser, it is true, has made observations of a substance prepared from testicular tissue, and administered by the mouth, which he claims is not so destroyed, but his claims have not yet been substantiated.

Of preparations available for subcutaneous or intravenous injections, such as testogan, prepared from a formula of Dr. Iwan Bloch, I have as yet but little personal experience, but I am convinced that it is in the discovery of an effective preparation of this nature that the chief hope of the future progress of the organotherapy of the testis lies. However brilliant the results that the implantation of a testicular graft may sometimes give, it is obvious that severe limitations are imposed on such a method of treatment, and that as was the case in the organotherapy of the thyroid, but little advance will be made until the use of grafts is replaced by that of a really efficient extract.

TESTICULAR GRAFTS.

The partial success that followed the use of thyroid grafts towards the end of the last century revived interest in the subject of gland transplantation in general, and it was not long before further attempts were made to remedy testicular deficiency by the use of grafts. The difficulty of obtaining material has resulted in an extensive trial of animal grafts, and although it has long been obvious that these are rapidly absorbed, good results have sometimes been obtained owing to the fact that during the process of absorption a certain quantity of internal secretion finds its way into the blood stream. L. L. Stanley, who has worked particularly along these lines with animal grafts, has reported very favourably on their use. His method of implantation, although seemingly crude, would appear to have had the merit of enabling the treatment to be carried out on a large scale, his own observations being made on 656 prisoners in the Californian State prison. All that Stanley found necessary was to cut up the testicle into very small fragments and to inject these through a syringe with a large calibre needle into the subcutaneous tissue of the abdominal wall. Strange to say, very little local trouble would appear to have followed this crude method of implantation, the grafts being palpable as small subcutaneous nodules until they became completely absorbed a few months later.

In order to avoid the fate that invariably overtakes grafts obtained from the lower animals, Voronoff in 1920 made use of a testis taken from an anthropoid ape. As the result of this and of many subsequent operations he has come to the conclusion that grafts obtained from the higher apes are capable of surviving in the human body for an indefinite period. In his "Greffes Testiculaires," published in 1923, he has reported cases in which the improvement following a graft has persisted for as long as three years, and he himself is not inclined to set any limit to the duration of the benefit that may result from their use. Other workers, notably Lydston, Lichtenstern, Lepinasse, and Morris, have used for the purpose of grafts human testicles obtained from recently executed criminals, from patients dying as the result of accident or of certain specified diseases, and from cases of ectopia testis. In my own work I have made use of the last-named source, and am convinced that it is the most practical method of procuring suitable material for this purpose. Whatever may have been Voronoff's results with grafts derived from the higher apes, it is obvious that the chances of success are greater if human tissue be used. An ectopic testis,

deficient though it may be as regards spermatogenesis, is usually well-developed from the point of view of internal secretion. In those cases in which there is a healthy and normally placed testicle on the opposite side, and in which the shortness of the cord is an obstacle to orchidopexy, removal of the misplaced organ is justified, for, as Lipschutz has shown, as little as 1 per cent. of the total testicular tissue is sufficient to maintain masculinisation. Most of the material used in my own series of cases recorded below was obtained from young donors between the ages of 10 and 22, in whom the secondary sex characters were well developed. Previous to operation a Wassermann test was performed, and a careful examination carried out in order to exclude the existence of tuberculosis, malaria, or any other constitutional disease. The operative technique, the type of case selected for grafting, and the results obtained will now be considered.

OPERATIVE TECHNIQUE.

Many different sites have been selected for the implantation of grafts, the most commonly favoured being within the peritoneal cavity or in a subperitoneal pocket, in such a muscle as the rectus abdominalis, within the cavity of a long bone, in the spleen, in the subcutaneous tissue and, in the case of testicular grafts, within the tunica vaginalis of the scrotum. It has been shown that the healing in of a transplanted gland is invariably preceded by a transient phase of degeneration which, slight at the periphery, becomes more intense towards the centre. Until vascularisation can take place the graft is dependent for its nutrition on osmosis from the surrounding tissues. Once the blood-vessels have found their way from the periphery towards the centre of the graft a process of regeneration starts, the surviving cells of the graft proliferating and the central necrosed area becoming transformed into connective tissue. It will be seen, therefore, that the critical period in the history of a graft is the period prior to vascularisation during which the transplanted organ is dependent for its nourishment on osmosis. Now the implantation of a graft within the peritoneum or in a serous sac like that of the tunica vaginalis has a definite advantage. It provokes a certain amount of serous exudation, which furnishes an excellent medium for the survival of the graft during these critical days. For this reason in my own work I have followed the technique of Lydston and Voronoff, and have placed my grafts within the tunica vaginalis. Only in those cases in which, owing to previous disease or operation, the vaginal cavity has become obliterated have I had recourse to Lichtenstern's method of embedding grafts in the rectus muscle, and even in those cases I have made a practice of placing an additional graft in a subperitoneal pocket. When the tunica vaginalis has been the site of previous inflammation, as in most cases of genital tuberculosis, or when difficulty is found in identifying the vaginal cavity on account of partial obliteration, it is useless to persist in any attempt to place a graft in the scrotum. In those cases in which I have infringed this rule (see Case 6) the grafts have either failed to vascularise or else have been rapidly absorbed.

The actual technique of the operation is as follows. The donor having been anæsthetised, the misplaced testicle is removed with as little trauma as possible, and if practicable surrounded by its serous sac. Until required it is wrapped in gauze wrung out in saline and placed in a sterilised bowl. Although the implantation of the graft can be carried out under local anæsthesia, I prefer the use of a general anæsthetic, as in my opinion it is best to avoid the risk of damage to the tissues through the infiltration of novocain. An incision is made in the upper half of the scrotum and the cavity of the tunica vaginalis opened. Bleeding-points are then tied, special attention being paid to hæmostasis throughout the whole operation since post-operative bleeding is likely to jeopardise the safety of the graft. The testicle to be grafted is then removed from the bowl in which it has been stored, the sac opened and the body dissected away from the epididymis. The testis is then divided into two halves by sagittal section and the halves subdivided into three. Each of these portions is then attached to the tunica vaginalis and anchored in position by fine catgut sutures in such a way that the glandular surface of the graft is in contact with the serous surface of the tunica vaginalis. In order to encourage vascularisation the tunica vaginalis may be lightly scarified as a preliminary to the implantation of the graft. In those cases in which a testicle exists in the recipient a graft may conveniently be placed in the digital fossa between the epididymis and testis (Fig. 1). Care must be exercised to ensure that no two grafts are in contact, as such contact is likely to cause necrosis. After making sure that the three grafts are well placed, I close the tunica vaginalis by means of a continuous catgut suture, and bring together the scrotum in two layers, one line of sutures uniting the deep fascia and the other the skin. The same proceeding is then carried out on the opposite side. It is unnecessary to point out that the strictest asepsis must be observed throughout the operation.

FIG. 1.

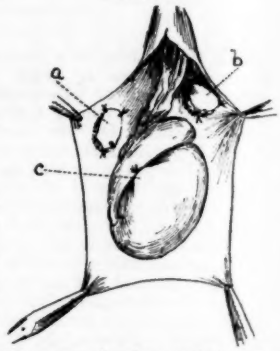


Diagram showing technique of testicular grafting. The tunica vaginalis has been laid open and three grafts (*a*, *b*, *c*) inserted. *a* and *b* are attached to the parietal layer of the tunica vaginalis, and (*c*) inserted in the digital fossa of the testis by means of fine catgut sutures.

Dressings are then applied and the patient is returned to bed. For 24–48 hours after the operation a certain amount of swelling of the scrotum is usually noticed, the swelling being due to the transudation of the serous fluid into the vaginal cavity; this transudation, as has previously been pointed out, plays an important part in maintaining the life of the graft during the critical period that precedes its vascularisation. At the end of a further three or four days this local reaction subsides. The patient may usually be allowed up, wearing a suspensory bandage for from 10 to 14 days from the date of the operation.

INFLUENCE OF TESTICULAR GRAFTS ON THE PATIENT'S METABOLISM.

It was felt that a few cases of testicular grafts carefully examined before and after treatment would furnish more reliable evidence of the value of the method than a larger number in which the examination had been less complete. In the cases recorded in literature by other workers the proof that the transplant has had effect rests entirely on clinical grounds, reliance being placed on the patient's general appearance, his capacity for greater muscular exertion, his mental condition, and his sexual history. These criteria, although of undoubted value in assessing the effect of a graft, are not absolutely reliable, for they are all likely to be influenced by the factor of mental suggestion. In order to obtain data on which more confidence could be reposed in several of the cases recorded below, a careful investigation was carried out of the metabolism of the patient before and after operation. Although little is at present known of the influence exercised by the gonads over metabolism, it is, at any rate, certain that such an influence exists. Heymans has shown in the cock that total castration diminishes metabolism by 20–25 per cent., and that partial castration diminishes the respiratory exchange by some 15 per cent. Löwy and Richter, working on castrated dogs of both sexes, found that after castration metabolism was reduced

in the proportion of 14–20 per cent. per kilo. of body-weight, and that this reduction was maintained for months or even years. They also concluded that the reduction of metabolism after castration is due to a diminution of the processes of oxidation, but that the obesity that not infrequently follows may be constitutional and is not necessarily degenerative. The work of Dixon, Mackenzie Wallis, and others on ovarian secretion suggested to me that alterations in the internal secretion of the testis might equally well be rendered evident by the employment of sugar-tolerance tests, and that valuable evidence of the "taking" of a testicular graft might, therefore, be obtained by carrying out careful blood-sugar estimations, before and after operation. This has been carried out for me by Dr. P. O. Ellison, assistant pathologist to the Royal Northern Hospital, whose results are appended to the case reports given below. To him my thanks are due for the care and interest he has shown in these investigations, as also to the Medical Research Committee for providing me with the necessary apparatus. Investigations of metabolism have been kindly carried out for me by Prof. Winifred Cullis, and her results are also appended.

Although the observations on the blood-sugar curves are too few to allow of any deductions concerning the influence of testicular secretion on sugar tolerance, they have served their purpose in demonstrating that, as a result of the graft, an alteration in tolerance has taken place.

CASE 1.—Patient, aged 29, wounded July, 1916, a fragment of shell lodging in the pubis just at the root of the penis, destroying the right testicle and causing an extensive hæmatoma of the abdominal wall. The remains of the right testicle were removed on reaching the hospital. Subsequently the left testicle atrophied as the result of interference with its blood-supply. At the time of wounding the patient's age was 23, and he was in every way normal as regards sexual development. He had married a year previously, had regular intercourse three or four times a week, and was athletic in his habits, representing his unit in boxing and running. Previous to the outbreak of war he had earned his living as a general labourer. Subsequent to the loss of the testes certain changes occurred. His weight dropped from 10 st. 4 lb. to 8 st. 13½ lb., and the growth of the beard diminished so that instead of shaving on alternate days as he had previously done he now shaved only every fourth day. There was complete loss of potency and absence of sexual desire. The bowels, which had previously acted regularly, now gave trouble, so that he was forced to take a purgative daily. Associated with these changes was a complete alteration in mentality; he lost interest in everything and the slightest effort produced fatigue, so that he could not even read the newspaper or a magazine. Half an hour's walk was sufficient to cause exhaustion, and after his discharge from the army he was compelled to give up his former work in favour of a less strenuous occupation. In addition to constipation and fatigue he complained of occasional "cold sweats" and of attacks of "giddiness" on bending down. The patient felt his condition so acutely that he readily consented to operation. Before grafting various laboratory examinations were made. Details of these are appended. In addition to these pathological investigations, and in order to obtain an unbiased estimate of the patient's psychology, he was sent to the National Institute of Industrial Psychology, and examined by Dr. G. H. Miles, whose report is given in extenso below.

Operation.—On Dec. 15th, 1922, under general anæsthesia, six grafts from the ectopic testis of a boy of 10 were inserted, three into each tunica vaginalis, according to the technique previously described. Convalescence was uneventful, the wounds healing by first intention and the stitches being removed on the eighth day. On the tenth day the patient noted the beginning of transient erections, which gradually became more frequent and stronger. He became conscious at the same time of an improvement in his general health. When seen five weeks later the erections were strong and well maintained and there was a definite return of sexual desire. The growth of the beard had increased so markedly that he was compelled to shave daily. From this time onwards he began to take more exercise and to show a renewed interest in life. Instead of sitting listlessly in a chair as was his previous habit, he bought newspapers, went three times to the theatre in one week, and became generally energetic. On Jan. 24th, 1923, he effected coitus with complete success. When seen on March 7th, nearly three months after his operation, he appeared to be in excellent health. His weight had increased from 8 st. 13 lb. to 9 st. 12 lb. and he reported that he was taking long walks, and had decided to abandon his sedentary occupation in favour of an open-air life. He had regular coitus with his wife and on two occasions he had in addition experienced a nocturnal emission. When examined, the grafts could still be felt in the scrotum, although they seemed definitely smaller than when previously examined.

A letter received on Jan. 21st, 1924, states that the patient remains in good health. Sexual desire is strong and he is able to gratify it. He reports that he is shaving daily, that the growth of hair is strong and is increasing in amount both on the chin and on the scalp. The results of the blood examination before and after operation, and Dr. Miles's psychological report are appended.

	Dec. 12th.	Jan. 22nd.
Hæmoglobin	90%	80%
Leucocytes	3,700	15,400 per c.mm.
R.B.C.	5,600,000	4,800,000 "
Colour index	0·8	0·8
Differential count:		
Polymorphs	51·5%	64%
Lymphocytes	45·5%	34%
Large mononuclears	2·0%	2·0%
Eosinophils	0·5%	0·0%
Basophils	0·5%	0·0%
No abnormal cells.		
Blood-urea	40 mg.	37 mg. per 100 c.cm.
Wassermann test	Negative.	

Psychological Report.

Tests.	1st exam. (Dec. 14th, 1922.) (Before operation.)	2nd exam. (Jan. 31st, 1923.) (After operation.)	Percentage improvement.
General Intelligence:—			
1. Opposites	21	34	+62
2. Analogies	9	10	+11
3. Mixed sentences	9	9	+ 0
4. Completion	23	39	+70
5. Reasoning	10·5	11·5	+ 9
Total	72·5*	103·5‡	+43
Fatigue: Kraepelin addition:			
(*a*) Total time sustained	130 secs.	895 secs.	+588
(*b*) Total number sums added	69	615	+791
(*c*) Average number sums added per minute	31·9	41·2	+ 29
(*d*) Av. rate per 10 secs. (first 40 secs.)	7·0	6·8	(− 3)
(last 40 ,,)	3·0	6·0	(+100)
Loss	4·0	0·8	+800
Average improvement			+552
Physical Test — Dynamometer:			
(*a*) Right hand (average of six trials)	19·5†	25·5§	+31
(*b*) Left hand (average of six trials)	22·8	24·9	+ 9
Average improvement			+20

Note.—Marked improvement is shown in every type of test. The improvement is most striking in the "fatigue" test; well-marked in the test of general intelligence (particularly in tests of speed and attention); and least in the test of physical strength.

* Distinctly below the average level for young adults—viz., 100.
† Equivalent to the strength of grip of an 11-year old boy.
‡ Slightly above the average level for young adults.
§ Nearly equivalent to the strength of grip of a 14-year old boy.

Report on Respiratory Exchange, by Prof. Winifred Cullis.

The striking features in this case are the marked increase in oxygen consumption per square metre of surface after the operation, and the improved capacity for work. In the first two observations (although certainly some improvement had occurred at the time of the second observation), the patient was unable at the quick rate of breathing induced to obtain an adequate exchange. The quick, shallow breathing gave an oxygen intake less than that needed in the sitting position, and as a consequence there followed anoxæmia and faintness. In the third observation the condition was clearly improved. There was a better intake of oxygen during the exercise, and the response to the increased carbon dioxide was much better under control, so that in the recovery period, although the respiration was

still quick, the rate was compensated for by an increased depth of respiration and an adequate oxygen intake. Even in this observation, however, there was a tendency to failure at the fifth minute, corresponding to a slightly diminished intake; that, however, passed off quite quickly.

In both Case 1 and 2, therefore, there is a definite improvement as shown by the respiratory exchanges. It is hoped to make another series of observations at a later date.

Oxygen Consumption.	Dec. 14th.	Jan. 23rd.		Jan. 29th.		
Resting and post absorptive.						
Lying—	Per c.cm.	c.cm.	Pulse.	c.cm.	Pulse.	Resp.
Per minute ..	260	300	68	410	72	36
Per metre per min.	153	180		244		
Sitting—						
Per half min. ..	295	223		256	..	R. = 44
Exercise 1½ mins.—						
1st half min. ..	295	343		548		
2nd " ..	408	456		648		
3rd " ..	453	—		620		
Recovery—						
1st " ..	346	—				
2nd " ..	—	426		368		
3rd " ..	—	313		327		
4th " ..	270	—		299		
5th " ..	233	—		—		
6th " ..	246	202		248		
7th " ..	192	—		—		
8th " ..	209	232		235		
9th " ..	—	—		—		
10th " ..	203	221		217		
11th " ..	—	—		—		
12th " ..	—	—		—		
13th " ..	*189	209		247		
14th " ..	—	—		—		
15th " ..	—	208		—		
16th " ..	—	—		209		
17th " ..	—	—		—		
18th " ..	—	266		—		
19th " ..	—	—		278		
20th " ..	—	174		—		
21st " ..	—	—		—		
22nd " ..	—	—		262		
23rd " ..	—	—		—		
24th " ..	—	*288		—		
25th " ..	—	256		286		
				—		
				297		
	After 20 mins. ..			280	..	R. = 52
	Pulse 67			280		

* Began to feel faint.

CASE 2.—A naval officer aged 34. This case was referred to me by Dr. Langdon Brown, under whose treatment he had previously been. The patient showed a very marked degree of eunuchoidism with a history of having suffered from mumps complicated by double orchitis at the age of 13. The effects of this were not at first noticeable and from 17–21 he had led a fairly active sexual life. At 23 he discovered that his testicles were small in size and that he was losing interest in sexual matters. (Fig. 2.) At the same time there was a steady increase in weight. At 31 he was operated on for an abscess in the antrum of Highmore and one month after the operation was seized with violent headaches, terminating in vomiting. These cerebral attacks continued for two years, although repeated X ray examinations failed to reveal any trouble in the sinuses. In December, 1922, he consulted Dr. Langdon Brown, who discovered the eunuchoid condition and believing that his headaches were pituitary in origin put him on a combination of pituitary and orchitic extract. Under this treatment his headaches diminished in intensity. In May, 1923, he was referred to me for grafting.

His condition at that time was as follows: Age 34, height 6 ft. 1 in.; weight 14 st. 8 lb. The most striking feature about the patient was the development of fat, especially in the gluteal, supra-gluteal, and mammary regions. There was nothing unusual to note about the bony or muscular development, which appeared normal for a man of his age, except that the muscle tone was generally poor and the abdomen unduly prominent and pendulous. The complexion was somewhat striking, the skin having a faintly yellow tint and the cheeks being a dusky crimson.

Hair.—There was a marked alteration in the distribution of hair. The hair of the head was plentiful and curly, but except in the axillæ and on the pubis it was absent from the trunk. The arms and legs were equally smooth. The pubic hair, although plentiful, ended above in a well-defined horizontal line as in the female. There was no hair about the umbilicus or around the nipples.

External Genitalia.—The penis and scrotum appeared normal, the testes were undersized, unduly soft to the touch, and without testicular sensation. Cremasteric reflex absent. Prostate small. Vesicles not felt. There was marked development of the breasts with rosy nipples and complete absence of hair. The mental condition excellent, although previously the patient had suffered from prolonged bouts of despondency. Blood counts, sugar-tolerance tests, and metabolism curves are appended later.

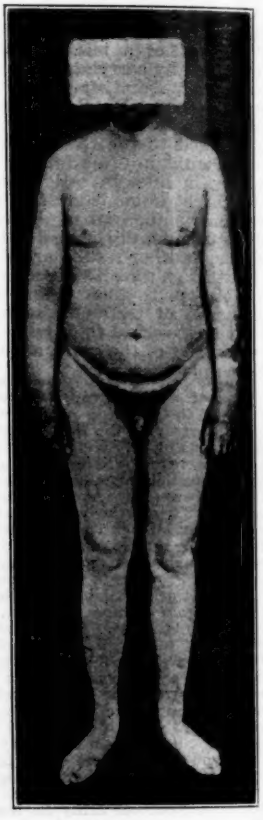
Operation. — August, 1923, under general anæsthesia, six grafts were inserted, three into each vaginal cavity.

Course of Case.—Normal. The patient was discharged on the fourteenth day feeling well but otherwise no change was noted.

Blood Count.—R.B.C., 5,200,000; W.B.C., 12,000; hæmoglobin, 86 per cent.; colour index, 0·82. Differential: polymorphs, 53 per cent.; lymphbcytes, 41 per cent.; large mononuclears, 4·5 per cent.; eosinophils, 1 per cent.; basophils, 0·5 per cent. Wassermann test negative.

Subsequent History.—No change was noted until Sept. 17th, 1923, when an increased growth of hair on the chin was detected, the growth in 12 hours being as much as previously occurred in 24. There was also a change in the character of the nipples, which had lost their rosy pink and taken on a more masculine hue. Nocturnal emissions were more frequent and erections stronger. There has been a steady diminution in weight since the operation (15 st. to 13 st. 9 lb.) and an increase in energy. He has had no headaches. Nov. 19th: No marked change since previous examination. There is certainly an increase in the rate of growth of hair, so that the patient now shaves daily. The deposits of fat in the breasts, buttocks, abdomen, and thighs do not appear to have diminished. The patient feels remarkably well, and is capable of greater muscular effort. In view of the fact that other glands are involved in the deficiency he has been placed on pituitary extract.

FIG. 2.



Case of eunuchoidism showing typical changes associated with lack of internal secretion of the testis. The arrangement of the pubic hair is as in the female, and there is marked hypertrophy of the breasts, increase of fat over the hips, and disappearance of hair on the body. The patient was treated by means of testicular grafts placed in the tunica vaginalis.

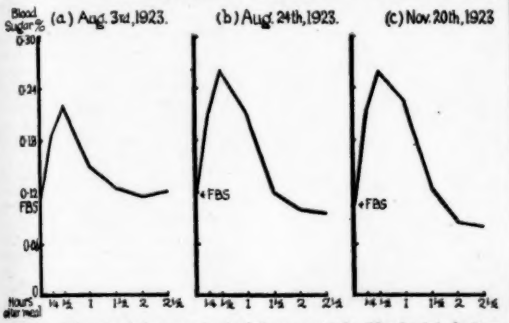
Report on the Respiratory Exchange, by Prof. Winifred Cullis.

Oxygen Consumption.	July 3rd.	Nov. 14th.
Lying—		
Per min.	297 c.cm.	288 c.cm.
Per sq. metre per min. ..	137·5 c.cm.	138 c.cm.
Cals. per sq. metre per hour	38	38
Exercise—		
1st half min.	658·4 c.cm.	436·5 c.cm.
2nd "	876·4 c.cm.	592·0 c.cm.
6th "	1225·0 c.cm.	814·0 c.cm.
8th "	—	774·7 c.cm.
Recovery—		—
10th half min.	732·4 c.cm.	201·9 c.cm.
11th "	—	162·1 c.cm.
14th "	—	

This case presents certain differences from Case 1. The departure from the normal is not so great, and the oxygen consumption (slightly below normal) is practically the same

for both observations. The respiratory quotient throughout is extraordinarily low, never rising above 0·79 and falling to 0·66 during the exercise. There is, however, in the second observation a marked improvement with regard to exercise; the oxygen consumption does not rise so greatly (the subject weighed 13 lb. less), and the return to the normal level is almost complete within three minutes of the cessation of exercise. At the first examination the oxygen consumption was still considerably above the resting value three minutes after work had ceased. (Fig. 3.)

FIG. 3.—*Glucose-Tolerance Curves (by Dr. P. O. Ellison).*



Case 2.—Glucose-tolerance tests (glucose meals, 50 g.): (*a*) before, (*b*) after testicle graft, (*c*) four months later. Urine: (*a*) no sugar before test, slight reduction after one hour, no reduction after two hours; (*b*) no sugar before, much sugar one hour after glucose, a trace after another hour; (*c*) no sugar before test, much sugar one hour after glucose, a trace after another hour. F.B.S. = fasting blood-sugar.

CASE 3.—The patient, aged 15½, was an intelligent healthy-looking boy who complained that he had been rejected for the Air Force owing to his lack of development. On examination he resembled a boy of 12, his height being 4 ft. 11 in. and his weight 6 st. 12 lb. The external genitalia were very small, not larger than those of a boy of 7. The testicles were the size of almonds and very soft to the touch. There was complete absence of hair on the body and the limbs. There were no abnormal deposits of subcutaneous fat on the breasts or elsewhere about the body and nothing of note in the bony development. The condition appeared to be one of delayed puberty possibly resulting from a pituitary defect of the Loraine type. An examination of the mental development carried out by Dr. Miles showed that the patient was distinctly above the average of the ordinary secondary school scholar. In contrast to previous cases sent for examination, he showed an unusual resistance to mental fatigue. The patient's parents were of normal development, but he had a brother who was also juvenile in appearance. Orchitic extracts by the mouth having failed to produce any effect, grafts were employed.

Operation.—On August 27th, 1923, three grafts were inserted in the right tunica vaginalis and at the same time circumcision was carried out on account of phimosis. On examination of the small testicle exposed during operation it was found to be of the variety generally seen in undescended testicle, the epididymis being large relative to the testis and separated from it by a large digital fossa in which a graft was placed. The wound healed by first intention and the patient was discharged on the fourteenth day.

Subsequent History.—He was examined on Nov. 9th, two and a half months after operation; height 5 ft., weight 6 st. 11 lb. No change could be seen beyond the appearance of some very fine hairs upon the pubis. The grafts could still be felt in the upper part of the scrotum. On Dec. 12th, continued growth of fine hair on pubis; height 5 ft., weight 6 st. 13 lb. The patient is still under observation. Although there has only been an increase in height of one inch since the operation, and although the genitalia do not appear to have increased materially in size, the growth of pubic hair is of favourable import.

CASE 4.—Patient, aged 21, was admitted to the Miller Hospital under the care of Mr. Cecil Joll on Feb. 5th, 1923, for symptoms of pituitary tumour, the symptom being persistent headache, vomiting, and failure of vision. Although 21 years of age he had the appearance of a child of 12, and it was stated that he had not grown since that age. Vomiting had started at the age of 13, had no relation to food, and was accompanied by severe occipital headache. During the last six months there had been failure in eyesight, marked loss of flesh, and a great increase in the severity of his symptoms. Examination of the discs showed a condition of "choked disc" with surrounding œdema and small superficial hæmorrhages. Skiagrams negative. Examining the patient from the point of view of the genitalia I found that he had development of a boy of 10. The testes could just be palpated and appeared unusually soft. There was complete absence of hair on the trunk, and only a few fine hairs on the forearm and thigh. There was no prominence of the breasts, and the amount of subcutaneous fat was everywhere below the normal. Although unusually intelligent and alert, the patient appeared to have no sexual knowledge, and never to have shown any interest in the opposite sex.

A diagnosis of the pituitary tumour was made, and in view of the increasing symptoms a decompression operation was carried out on Feb. 8th by Mr. Joll. On the 12th I inserted three grafts into the right vaginal cavity, in order to test their effect on the patient's genital development.

Subsequent History.—Three days after the operation the patient called the house surgeon's attention to the fact that he was experiencing erections for the first time in his life. These continued and appeared to become stronger, but unfortunately the cerebral condition, which had at first been benefited by decompression, again began to cause trouble. A second decompression on the left side was therefore carried out, again with temporary benefit. The patient, however, showed progressive emaciation, and his condition steadily deteriorated until his death on July 20th.

Post Mortem.—The body showed a very severe degree of emaciation. Over the pubis, which previous to the operation had been bare, were some strong dark hairs. On removing the brain a tumour, about the size of a walnut, was found on the upper part of the medulla, spreading upwards into the fourth ventricle, and extending laterally between the pons, medulla, and cerebellum.

Examination of Genitalia.—The scrotum was opened and the testicles removed for examination. The only remains of the grafts that could be found consisted of a small area about a centimetre in diameter in the upper part of the tunica vaginalis. Mr. Geoffrey Keynes's report on his histological examination of this area is appended, as well as the report on the patient's testicle.

Sections of Testis and Testicular Graft.

(1) *Graft.*—The graft appears as a thin layer of tissue lying on the surface of the epididymis. No normal tubules remain in the graft; each appears to be represented by a space containing one or more large structureless cells with peripheral nuclei. No interstitial cells can be seen with Soudan III. Although the testicular tissue appears to have degenerated almost completely, the graft contains several well-formed blood-vessels. The epididymis and vas deferens are normal.

(2) *Testicle.*—The tubules of the testicle are undeveloped. There is no sign of spermatogenesis. No interstitial cells can be seen in paraffin or gelatin sections, though small fat globules are visible among the epithelial cells in a few of the tubules.

Note.—The only positive results obtained by grafting in this case were the onset of erections and the development of pubic hair. The very marked emaciation and the rapid downward course of the patient as the result of his cranial condition were, however, unfavourable factors.

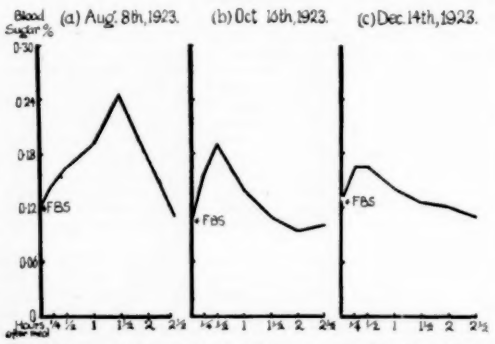
CASE 5.—Patient, aged 39; in August, 1922, had left testicle removed for tuberculosis; in April, 1923, had right testicle and cord removed for recurrence of disease on opposite side. Since the loss of his second testicle he had not been conscious of any marked change either physical or mental. Partial erections occasionally in the morning: no nocturnal emissions. The patient was engaged to be married and presented himself for grafting in the hope that this would allow him to carry through his plans. His only complaint was that erections were rare and transient, and that he was conscious of a very definite loss of muscular energy so that he tired after a comparatively short walk (one mile). Previous to his operations he had walked 12 miles without difficulty. He was not conscious of any mental deterioration, memory and concentration being good, nor had he suffered from depression or other alterations in temperament. Since his operation he had lost a stone in weight. On examination the chief indication of lack of testicular secretion was the absence of hair about the trunk and limbs, except over the pubis, and in the axillæ. However, he still shaved daily, and the hair of the scalp was unaltered. There were no abnormal deposits of subcutaneous fat or development of the breasts. The penis had not appreciably altered in size and the prostate was still palpable.

Operation.—On Sept. 9th, 1923, grafts from the ectopic testis of a man of 38 were employed and were inserted in the following situations: (1) Right tunica vaginalis, (2) left rectus, (3) subperitoneally in the left inguinal region. Convalescence was as usual, except that the patient complained a week later of intense frontal headaches. These were intense for a week and then gradually diminished. Associated with the headaches was a certain degree of

polyuria, as much as 66 oz. being passed per diem. A careful examination failed to discover any cause for the headaches in the eyes, nasal passages, or sinuses, and it is possible that they were pituitary in origin and resulting from the action of the grafts on that gland.

At the end of ten days the headache diminished in intensity, the polyuria ceased, and the patient stated that he felt better. He is still under observation, but has up to the present noted very little change in sexual feeling or in the strength of his erections. However, that the grafts have not been without influence is shown not only by the phenomenon of headaches and polyuria already referred to, but also by the change in the blood-sugar curves.

FIG. 4.



Case 5.—Glucose-tolerance tests (glucose meals, 50 g.): (*a*) before, (*b*) after testicle graft, (*c*) two months later. Urine: (*a*) no sugar before test; no further example could be obtained; (*b*) and (*c*) no sugar before or after taking glucose.

Blood Count (August 3rd, 1923).—R.B.C., 5,300,000 per c.mm.; W.B.C., 7200 per c.mm.; H.C., 94 per cent.; C.I., 0·89; polymorphs, 58 per cent. (4176 per c.mm.); lymphocytes, 32 per cent. (2304 per c.mm.); large mononuclears, 8 per cent. (576 per c.mm.); eosinophils, 2 per cent. (144 per c.mm.); basophils, 0 per cent.; no abnormal cells seen; Wassermann, negative.

General Examination of Urine (Dec. 14th, 1923).—Clear pale yellow urine with a small sediment. Reaction: Acid. Specific gravity: 1018. Albumin: 0·7 per cent. Sugar: Nil. Centrifugalised deposit: A few red blood cells. Fairly numerous white blood cells. Casts in moderate numbers, all hyaline. Some epithelial cells from the urinary tract. (Fig. 4.)

CASE 6.—Patient, aged 58, had had both testicles removed for tuberculosis, the right in November, 1921, the left in January, 1922. Subsequent to castration he put on over a stone in weight. There was also a diminution in the rate of growth of the beard, so that he only required to shave on alternate days, whereas previously he had shaved once or sometimes twice daily. Moreover, the bowels, which had previously been regular, now gave him great trouble, so that he was entirely dependent on purgatives. For two months after operation he had noted erections, but these were now absent. There was complete loss of sexual desire, but occasional nocturnal emissions, unaccompanied by any dream. In temperament he had changed so that he was inclined to be despondent and was without initiative. He complained of hot flushes occurring very frequently and causing him a good deal of distress. These started in the face which became very red, so that other people noticed it. The flush then spread to the rest of his body and he broke out in a profuse perspiration.

Operation.—On Feb. 12th, 1923, an incision was made over the upper part of the scrotum. Considerable difficulty was experienced in finding the vaginal sac, which appeared to have been in great part obliterated, as a result of the previous operation. A bed was made for three grafts on either side, in what appeared to be the remains of the vaginal cavity, and the scrotum was closed in the usual manner.

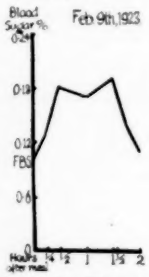
Course of Case.—For the first three weeks after operation the patient stated that he felt remarkably well, that his appetite had improved, and that he felt much less depressed. He engaged in reading and writing, and said that his hot flushes troubled him very little. A week after the operation he had had an erection. The improvement, however, that was at first noted was not maintained, and when seen two months later the patient had relapsed into his previous condition. On examining the scrotum no remains of the grafts could be felt, and it is almost certain that they had become completely absorbed. The failure in this case was due to the error of persisting in the scrotal operation instead of abandoning the attempt to find a tunica vaginalis and emplanting the grafts, as in Case 5, in the rectus muscle. (Fig. 5.)

	Feb. 8th, 1923.	Feb. 22nd, 1923.
Blood Count:		
R.B.C.	4,960,000	5,840,000
W.B.C.	10,800	12,000
Hæmoglobin ..	90 per cent.	90 per cent.
C.L.	0·9	0·79
Differential Count:		
Polymorphs ..	46 per cent.	66·5 per cent.
Eosinophils	3 „ „	2·5 „ „
Large mononuclears	4 „ „	3 „ „
Large lymphocytes ..	44 per	26·5 per
Small „ ..	30 cent.	24·0 cent.
Transitionals ..	3 per cent.	0·5 per cent.
Blood urea	17 mg.	

CASE 7.—The patient, aged 30, was referred to me by Dr. Crichton Miller as a typical case of dementia præcox. He gave no evidence of testicular deficiency, but in view of the work of Mott and others on the degenerative changes occurring in the testes in these cases it was considered justifiable to try the effect of a graft.

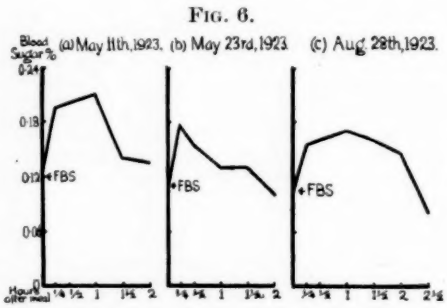
Operation.—Grafts were implanted on May 15th, 1923. The patient was seen two or three times after the operation, but no alteration in his condition, either mental or physical, could be found. Estimation, however, of the blood-sugar curves showed that the grafts had not been without effect on his metabolism. In view of the fact, however, that dementia præcox is associated not only with changes in the testis but also with widespread degenerative processes

FIG. 5.



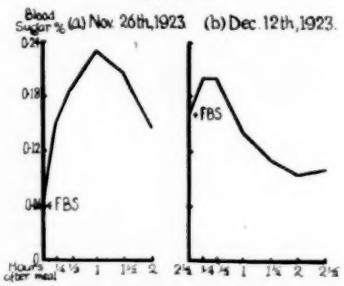
Case 6.—Glucose-tolerance tests (glucose meals, 50 g.). Unfortunately no curves were obtained after operation.

FIG. 6.



Case 7.—Glucose-tolerance tests (glucose meals, 50 g.): (*a*) before, (*b*) after testicle graft, (*c*) three months later.

FIG. 7.



Case 8.—Glucose-tolerance tests (glucose meals, 50 g.): (*a*) before, (*b*) after testicle graft.* Urine: (*a*) no sugar before test; no further sample could be obtained; (*b*) no sugar before test; glycosuria present one and a half hours after the meal.

* This patient partook of a fairly substantial meal immediately before the time appointed for his test. It was only possible to keep him fasting for two hours from the beginning of his lunch, as the alternative meant the complete abandonment of the tolerance test. Hence his "fasting" blood-sugar shows a state of hyperglycæmia. It is worthy of note that otherwise the type of response to 50 g. of glucose before and after the testicle graft is identical with that of Case 5.

in the endocrine as well as in the central nervous system, it would be too much to expect that a testicular graft should have any tangible effect in such a condition.

Blood count (May 11th, 1923): R.B.C., 5,200,000; leucocytes, 6800; hæmoglobin, 100 per cent.; colour index, 0·96. Differential count: Polymorphs, 59 per cent.; lymphocytes, 32 per cent.; large mononuclears, 6 per cent.; eosinophils, 3 per cent.; basophils, 2 per cent. (Fig. 6.)

CASE 8.—Patient, aged 45, referred to me by Colonel L. W. Harrison for impotence. The patient stated that he had occasional erections in the morning, but that they were transient in character. Sex desire was present though feeble. There were no obvious signs of testicular deficiency. He shaved daily, showed well-marked hair development, and normal development of the genitalia. He had been treated for syphilis and the right testis was indurated and shrunken.

Operation.—On Nov. 20th, 1923, six grafts were implanted within the scrotum. On Dec. 7th the patient stated that he had several strong and more prolonged erections. As he had to leave for Canada, no further opportunity occurred for examining him. (Fig. 7.)

CASES 9 and 10.—In both of these cases grafts were implanted for senility during the course of an operation for prostatectomy. Case 9 made an excellent recovery and left the hospital in a greatly improved state of health. As, however, most of this could be accounted for by the beneficial results of prostatectomy, it is impossible to say to what extent the testicular grafts had any effect. Case 10 was a feeble old man with marked kyphosis, bronchitis, and cardiac trouble, who died three weeks after enucleation, of pulmonary complications. During the first part of his convalescence he had made good progress, and on his death his relations (who knew nothing of the insertion of the graft) deplored to the house surgeon the misfortune of his death as he had been so well after his operation, and, what was so remarkable, the hair on his head had begun to grow again!

At the autopsy I examined the grafts that had been inserted. The operation had not been an aseptic one and there was evidence of suppuration. A microscopic examination of the grafts showed necrosis, more marked towards the centre of the graft. It is probable that the temporary improvement in his condition and the growth of hair were due to absorption of hormone, even although necrosis had occurred.

INFLUENCE OF THE GRAFTS ON THE GLUCOSE-TOLERANCE CURVES.

For the following description of the method of examining the patients, and for his comments on the changes observed in the glucose-tolerance curves after operation, I am indebted to Dr. P. O. Ellison.

"The method of blood-sugar estimation devised by Prof. H. MacLean has been used throughout. After a fast of three hours, a sample of blood was taken from the patient, who was immediately given a dose of 50 g. of glucose in 150 c.cm. of water. Further samples of blood were taken at intervals up to a period of two or two and a half hours. The amount of sugar in each sample was estimated, and a curve plotted from the results.

"The first curve in each series was made a few days before the operation; the second curve between two and three weeks after operation, to gauge the immediate effect of the absorption of testicular substance, allowing an interval for any possible inflammatory change to subside; the third after a further interval of from two to three months.

"In each case a definite change in the response to 50 g. of glucose has been found in the curve taken shortly after the graft. It might be expected that any modification that occurred would be of the same nature. The response of one patient, however, differs in a very striking manner from all the others (Case 2).

"In three of the patients, in the test taken before operation, the blood-sugar does not reach its maximum until one and a half, one, and one hour respectively. The maximums were unusually high—0·23, 0·25, and 0·21. The blood-sugar had diminished to approximately normal values within two to two and a half hours. These curves, therefore, show that the patients had a definite diminution of sugar-tolerance. The curve taken two to three weeks *after* operation shows that the blood-sugar reaches its maximum height within half an hour and has returned to normal value in an hour; the sugar-tolerance was therefore normal.

"Case 2 presents different features, for here the blood-sugar concentration half an hour after a dose of 50 g. of glucose is much higher (0·26) than before the graft, and it is accompanied by a pronounced glycosuria. The case is, however, complicated by the fact that he presents features of pituitary disease and the blood-sugar tracing resembles in some degree the curve described by MacLean under the name of 'lag' curve. Another test, repeated after an interval of three months, gives identical results.

"Taking these four cases into consideration, it seems reasonable to conclude that a definite effect has been produced on the mechanism of carbohydrate metabolism of patients who have been subjected to the operation of testicle grafting. In two of them the effect produced seems to be wearing off a little, but in the third the effect is maintained up to date. The natural assumption is that the change is due to the absorption of testicular hormone. The maximum effect is produced shortly after the implantation of the graft. It may be that a successful testicle graft, yielding testicular hormone, will cause a permanent alteration in the type of response to the ingestion of a certain amount of carbohydrate; and that a reversion to the former type of curve would mean absorption of the graft. In any case it is not desirable to attempt to interpret these changes any further, and it is best to keep an open mind on their significance until further cases and prolonged observation give us sufficient data to make our deductions."

THE LIMITATIONS OF THE TREATMENT OF TESTICULAR DEFICIENCY BY MEANS OF GRAFTS.

Although the results obtained from the treatment of testicular deficiency by means of grafts are distinctly promising, it must be remembered that there exist limitations to the use of the method quite apart from those imposed by the difficulty of obtaining material. In very few of the cases that present themselves for treatment with signs of testicular deficiency is the deficiency entirely confined to the testicle. In other words, we are seldom called upon to treat a frank state of hyper- or hypo-secretion of the testis. Especially is this true of those cases of congenital deficiency that are the result of some general pathological process taking place early in life. In such cases, even although only one gland may originally have been at fault, as the result of its failure other members of the endocrine group in time become affected. Tiernay has laid special emphasis on the importance of this reciprocal involvement of other glands, in a recent paper on the subject of pituitary disorders, and what is true of pituitary deficiencies is equally true of disorders of the testicular secretion. I cannot do better, therefore, than reproduce his own words on the subject: "We have found that many of the pituitary insufficiencies have been in their early stages apparently uniglandular and that after a variable length of time, usually a year, there almost constantly occurs a secondary reciprocal involvement of the thyroid and gonads. We have also found that after a reciprocal involvement, the diagnosis of which is based upon associated hormonic signs, there is less likelihood of sufficient response to therapy either single or compound."

An excellent example of this reciprocal involvement of other glands of internal secretion is furnished by No. 2 of the cases reported. In this case atrophy of the testis had been followed by involvement of the pituitary, so that the clinical picture was that of testicular deficiency associated with hypo-pituitarism rather than that of testicular insufficiency alone. For this reason the results obtained from a testicular transplant were limited and did not effect complete disappearance of symptoms. The same observations apply with even greater force to Cases 3 and 4, in which the pituitary gland was in all probability primarily at fault and the gonads only secondarily involved. To obtain the best results in these cases grafting should be combined with the use of extracts of the other glands involved.

Duration of Grafts.

A further question of the greatest importance in assessing the value of grafts in the treatment of testicular insufficiency is the question of their durability. Will a hetero-graft of testicular tissue that has been successfully vascularised survive indefinitely, or will it undergo slow absorption? To this question I am unable to give a positive answer based on my own work, as none of my operation cases are of sufficiently long standing to allow of deductions being made. Voronoff has stated that in one of his successful cases the improvement has been maintained for a period of four years, and he is not inclined to place a limit on the life of a graft. Personally I believe

that a hetero-graft, however complete its vascularisation may be, undergoes from the very beginning a process of absorption. I have arrived at this conclusion partly from a consideration of the behaviour of hetero-grafts in general, and partly from observations of my own cases. The time taken for a graft to become absorbed must, of course, vary in different cases, but I am inclined to think that a life of two years is the utmost that can be expected. This does not, of course, necessarily mean that at the end of that time the patient will relapse into the state in which he existed previous to his operation. Morris made the interesting observation that in one of his cases who possessed testicles, although atrophied ones, the insertion of a graft stimulated the growth of the patient's own testes, and that this enlargement was maintained even after the grafts were no longer palpable. A somewhat similar action may possibly be exerted on other endocrine tissue and the impetus given by the graft thus outlast its life. The probability, therefore, that grafts will in time become absorbed is not a valid argument against their use. It may, for instance, be possible by means of a transplant to assist a boy showing signs of eunuchoidism through the period of puberty, even although later the grafts may disappear. Lydston, who has been a pioneer in this work, has written in no undecided manner on the very topic: "It is my belief that practically all, if not all, subjects, if operated on at or about the usual age of puberty can be taken through puberty and will show sex development with corresponding secondary masculine sex characteristics approximating the normal more or less closely." I am in entire agreement with Lydston in this, provided the case be one of pure testicular deficiency and not one of hypo-pituitarism.

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THE RÔLE OF THE MUCOUS MEMBRANE IN DISEASES OF NOSE, THROAT, AND EAR.*

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COMPARING and contrasting the skin proper with the mucous membranes, or, as I should say, the inner skin, one cannot help being struck with the great attention that has always been and is still being paid to the skin; it has a history and a literature, and societies and journals devoted to its study. Investigation and research have made the skin a favourite field for work, whereas the mucous membrane or inner skin has suffered comparative neglect as regards systematic study as an organ and a system in the animal economy; and yet the part played by this inner skin is of paramount importance and far exceeds that of the skin proper as a body protector and preserver against the inroads of disease. For the functional activity of the mucous membrane it is indispensable that the surface should constantly maintain its natural moisture, and for this purpose a mucous secretion is continually being poured over it. Mucus is not the simple solution that we are apt to consider it, but is of very complex composition and extraordinary function. Its composition has not yet been elucidated. We know that it contains a protein radical and glucosamin—the nitrogen-containing carbohydrate of mucin, a non-fermentable sugar. This carbohydrate group is very rich in oxygen. Mucin also contains a very large amount of sulphur. It has now been proved that mucin with its wonderful chemical composition has a barrier action against the entrance of toxic ferments and bacteria into the system, and this in virtue of the fact that the nitrogen-containing carbohydrate is not fermentable, and is not affected by the oxidising and dissociating ferments of mammals. Mucin is also highly resistive to putrefaction, and it was affirmed by Cohnheim that "the peculiar physiological property of mucin makes the entrance of putrefactive bacteria a difficult matter, while the bactericidal properties also play a part.

One of the curious facts of pathology is that certain bacteria actually secrete a true mucin for their own protection against the attack of other bacteria. Mucin belongs to the amido group; its exact stereochemical position, being very intricate, has not yet been fully worked out. It is very rich in oxygen, however, and it is known that this oxygen is very loosely attached and can be, and is, readily parted with, and that it is in such a manner that enzymes (ferments) given off by virulent bacteria are destroyed and the body protected from their insidious and destructive ravages. The wide range and high value of mucin are therefore evident.

STRUCTURE AND FUNCTIONS OF MUCUS.

The structure of mucus in its singular complexity is enough in itself to support the belief that its functions are more intimate and subtle than that of a mere lubricant. The moist and sticky surface of the mucous membrane catches up the innumerable particles of dirt and bacteria that enter with the inhaled air. In order to carry out these purposes it is armed with two mechanisms of great value—one the secretion, mucus, of which we have just given a description, and the other the ciliary action of the mucous membrane. Once a stationary state becomes established, the bacteria and their toxins are likely to penetrate to the epithelial cells, and, by a solution of them through the production of enzymes—ferments—pass into the circulation. There is now experimental proof that in the "carrier" state when the body is protected from the onset of various pathogenic organisms it is the mucus surrounding the bacteria that restrains their virulence. This protection is not a real immunity in the essential meaning of the term, for its subjects often suffer an infection at a later date when the protective mucous barrier has gone. This explains why the deadly meningococcus and the deceptive diphtheria germ can rest in the naso-pharynx, throat, and nose, their host remaining immune meanwhile, but may be readily transmitted to another person not equally protected. The virulently-toxic Shiga's bacillus, in the same manner, can be lodged in the system for a long time without giving rise to toxic symptoms.

It is now 22 years since I first drew attention to the value of mucin as a therapeutical agent in two papers published in THE LANCET,[1] and research since that time has fully borne out its great usefulness.

THE EAR FROM THE ENTRANCE TO THE EUSTACHIAN TUBE UPWARDS.

In considering the mucous membrane and the part it plays in diseases affecting the various regions, we will first take that tract running from the pharyngeal end of the Eustachian tube up through the middle ear and on to the apex of the mastoid. The Eustachian tube and the tympanic cavity are lined by a common mucous membrane with a ciliated epithelium. The mucous membrane varies in its consistency, in the number of mucous glands and lymphatics, and in the kind of epithelium. From the lowest part of the Eustachian tube, where the mucous membrane is thick, it gradually becomes thinner and thinner right over the tympanic cavity through the aditus to the

* Abstract of an address delivered at the Central London Throat, Nose, and Ear Hospital.

[1] THE LANCET, 1901, ii., 972; 1902, i., 961.

lowest mastoid cells, where it is a muco-periosteum and contains neither mucous glands nor cilia. On the inner side of the membrana tympani it is a very thin delicate layer covered with squamous epithelium. The epithelium on the ossicle and tensor tympani and stapedius muscles is not ciliated. There are few mucous glands in the tympanic cavity, but throughout there is a distinct development of the lymphatic layer. At the pharyngeal end of the Eustachian tube, where it bulges into the pharynx, and for a third of its length upwards, there is a marked development of the mucous membrane; the latter is thick and vascular, and the lymphatics and mucous glands are well developed and numerous. At this part these structures constitute a veritable lymphatic gland surrounding the tube, and this acts as a guard to the entrance, effectually stopping, destroying, and carrying away any septic organisms that might try to work their way into the tympanic cavity from the naso-pharynx. Over the foramen rotundum the mucous lining is very delicate, as is the fibrous membrane that closes this opening, so much so that in life it is transparent, a thick mucous membrane would not aid the transmission of sound. At the entrance to the aditus there is a special fold of mucous membrane which practically makes the tympanum and the antrum independent cavities. This is often so well developed that mastoiditis may be present without otitis, or, as oftener happens, otitis without mastoiditis. The fact that the mucous lining of the antrum and mastoid cells is so thin as to constitute a muco-periosteum containing no mucous glands and having but very little underlying lymphatic layer explains what is familiar to us all—the rapid way in which sepsis can, and often does, spread in this region. In my experience, such cases of rapidly spreading sepsis with bone caries are most often met with in young adults. There may be an extraordinary degree of absorption of bone in the mastoid, especially of its inner shell, so that the whole process forms a single cavity bounded by dura mater and lateral sinus on the upper, inner, and posterior sides, while the outer wall resists perforation till late. Perforation (Bezold's) into the digastric fossa is common. In spite of this extensive destruction the temperature is usually normal, or but slightly raised. Peri-sinous abscess is very common, or the sinus may form part of the boundaries of a single large cavity. In one of my cases—a man of 40—the abscess within the mastoid communicated with a large peri-sinous abscess.

The sea of lymph in the submucous lymphatics of the middle ear and Eustachian tube doubtless communicates with the parilymph and endolymph, and in this way helps to maintain the tension in these situations, so essential for hearing and equilibration. The dragging action of the tensor tympani and stapedius muscles doubtless helps to pump this lymph on its course. Is it not likely that the connexion that has been shown to exist between middle and internal ear deafness has here an explanation? In otosclerosis, chronic catarrh of the middle ear, and chronic suppuration of the middle ear (residual) it is now found that there is an impairment of the labyrinthine function. This may be because through disturbance or cessation of this lymphatic circulation the tension in the perilymphatic and endolymphatic channels is impaired, and, therefore, the chance of the specialised epithelium in the organ of Corti, maculæ, and cristæ interpreting the vibrations of the waves of pressure is diminished. There can be little doubt that nearly all affections of the ear (especially now that nerve deafness is known to be largely influenced by middle-ear conditions) result from sepsis introduced from below and passing upwards into the Eustachian tube from a septic pharynx—a failure of the mucous and lymphatic structures, stationed at the lower end of the Eustachian tube, to protect the vulnerable middle ear.

After many years' experience I have come to the conclusion that chronic catarrh of the middle ear—that bugbear of otology—is a consequence of insidious sepsis, let into the tympanic cavity in this manner. This would cause irritation, for septic organisms and their products are exceedingly irritating to delicate mucous linings, especially if their virulence is not restrained by the presence of mucous secretion. These infections would also result not only in irritation and congestion of the mucous lining of the middle ear, but in desquamation of the superficial epithelial covering, ending in atrophy. It has often impressed itself upon me that even oto-sclerosis must be a consequence of sepsis. Once the mucous and lymphatic structures at the lower end of the Eustachian tubes are rendered useless, the passage is open, and tension not only in the middle ear, but also in the labyrinth, is reduced; nutrition of their structure is so altered that impairment and fixation follow.

NOSE AND NASO-PHARYNX.

In the nose and naso-pharynx the epithelial covering is everywhere ciliated except in the olfactory region proper, in the upper third of the nasal cavity. The lymphatic layer is also well developed throughout, and there is a great accession of it on the posterior wall of the naso-pharynx where adenoids accumulate. The lymphatic layer of the mucous membrane is also particularly well marked in the inferior turbinals, especially in the posterior half and on the posterior part of the nasal septum, in which situation mucous glands are specially abundant. The special functions of the mucus are pre-eminently displayed in the nose, where, being sticky, the mucus traps foreign bodies, dust, &c., and bacteria, entangles them, destroys them, dissolves them, and holds them till the phagocytes can come along and consume them. An efficient mucous membrane, then, lets nothing pass; and, if it did, whatever escapes would be blown upon the posterior wall of the naso-pharynx, and there caught in the same way as in the nose through which it had escaped.

Paget's investigations on the production of antibodies by the nasal mucous membrane which leads to destruction or neutralisation of the toxins of the tubercle bacillus are very remarkable, and well emphasise the high value of nose breathing in the prevention of respiratory diseases and the bactericidal properties of the secretions of the upper respiratory tract. Swabs taken from the nasal passages of students and nurses in consumptive wards are often found to contain tubercle bacilli, but tuberculosis of the nasal passages is quite rare. It is evident, therefore, that in the upper respiratory passage there is a bactericide capable of destroying these bacteria.

The mucous membrane of the nose is in one respect very different from that of the ear, in that it contains erectile tissue. The latter is absent in the Eustachian tube and tympanum; and just as much of our work in the ear results from the mucous lining being so thin, so also much of our work in the nose directly follows from the lining being thick and erectile, and thereby causing nasal obstruction, a very serious handicap in the fight against sepsis.

I should like to say a word about rhinitis sicca and nasal mucous polypi—two conditions frequently in our hands for treatment, and very common.

Rhinitis Sicca.—Rhinitis sicca—so called for want of a better name—or, as I should call it, hypomyxia-naso-pharyngia, the deficient secretion of mucus. This is, I think, much the commonest deviation from health of the nasal mucous membrane. The condition of the anterior half of the inferior turbinal is the criterion of the normal mucous membrane, and in health appears rosy-red, rotund, resilient, and moist. In rhinitis sicca it is pale, desiccated, crusty, and cobwebby—that is, strands of dry mucus pass from the septum to the turbinal. The rest of the nasal lining is more or less dry and crusty. This dry, and therefore functionless, condition of the mucous membrane of the nose frequently results in serious deterioration of health, since bacteria-laden dust is freely inhaled, passing unfiltered down into the lungs, and is a common precedent of tuberculosis. Moreover, normally over a pint of healthy mucus should pass down through the naso-pharynx to the œsophagus daily. In the absence of this these parts become desiccated,

with consequences which if prolonged over a lengthy period are many and varied, and always deteriorative. It is now recognised that man is becoming less and less hirsute. Nature seems to have anticipated that man would, in his multifarious occupations, be liable to have to respire all sorts of impure and bacteria-laden air; to combat the dangers incident to this respiration the nose is supplied with a most complete and efficient protective apparatus in the shape of the short stiff hairs lining the entrance of the nose. These hairs catch and hold dust and all debris from the air; and, after having been temporarily arrested, this debris is readily blown out again. Should such aerial flotsam and jetsam pass this air filter and be drawn, with the inspired air, into the middle chambers it would then be arrested and held by the mucous coating on the lining; and, most likely causing irritation, be violently expelled by setting up sneezing. This is how sneezing is beneficial, becoming a valuable protection by forcibly throwing out foreign material from the nose. Loss of hair on the external skin may be a matter of indifference to the human race, since we can readily replace its function by wearing extra clothing; but in the case of the nasal entrance, loss of hairy protection is a serious defect, enabling microbes freely to enter the nasal cavities—freedom of access which lays the body more readily open to bacterial attack. It is no less certain, however, that man, and especially woman, is rapidly becoming less and less mucose. Rhinitis sicca, or hypomyxia-naso-pharyngia, is becoming common. This means a dry nasal interior, the secretion from the nose being thin and watery—serous. In the absence of the sticky normal mucus the bacteria-trapping function of the nasal lining is lost, and its protection against inhaled particles diminished. The pint of mucous secretion that should be produced daily in the nasal spaces is in abeyance, and the moistening, protecting, and cleansing process that goes on through the passage of this amount of mucous discharge down over the naso-pharynx, oro-pharynx, laryngo-pharynx, and œsophagus ceases; thus these surfaces are exposed to irritation and become congested and inflamed, and malignant disease is likely also to arise as a result of prolonged epithelial irritation.

Nasal Mucous Polypi.—It is very noticeable that nasal mucous polypi always spring from the region of the middle turbinal or higher up, but never from the inferior turbinal. I have often told the students in my clinic that I would give £20 to anyone showing me a mucous polypus arising from the inferior turbinal. I think this immunity from polypi is due to two conditions—first, that the mucous covering on the inferior turbinals is much thicker and has many more mucous glands on it, being thus much less likely to become dry than the thinner lining of the middle turbinal; and secondly, because we inhale through the middle meatus, which is dried and irritated by the impact of the dust-laden inhaled air. The statement that there is always sepsis—even caries of the bone—at the spot from which the polypus springs I cannot accept. Again, we exhale through the inferior meatus, and the expired air saturated with water is constantly preventing the inferior turbinal from getting too dry, so dry that a mucous polypus might spring from it if irritation from dust, &c., were present. I am told by a friend who has travelled much in Russia that mucous polypi are very common in that country, almost every second person being affected. This is no doubt largely accounted for by the very sandy, dusty atmosphere, and the warm, dry, and impure air of the living rooms. Russia, when she has recovered from her present distressful state, is doubtless the field for our rising generation of naso-pharyngeal specialists.

The amount of dirt in the London atmosphere that the nose has to deal with and prevent from getting into the lungs is enormous. It is a fact that 5 million tons of coal are consumed in London annually for domestic purposes alone. It is calculated that as much as 90 tons of soot is a common quantity to be floating over London, and that when the wind is in the north dust is wafted down to us even from the Midlands. If we could roll away the clouds of smoke which daily hang over the homes of our people, we should by the same action make exiles and fugitives of many of our deadliest foes. It has been possible to create a smokeless New York, even a smokeless Essen. That London and other of our cities remain under this curse is proof only of our backwardness in making use of the knowledge which is now at our disposal. It will be agreed, I think, that the nose with a normal mucous lining is one of the chief gateways of health and happiness, and on its proper function depends both physical and mental efficiency.

MOUTH AND ORO-PHARYNX.

The mucous membrane of the mouth and oro-pharynx is covered with squamous epithelium thicker in some parts than in others, having in it comparatively few mucous glands, and those very minute. On the gums there are none; there are none on the dorsum of the tongue, none on the back of the pharynx; but there are mucous glands on the sides. The cavity of the mouth is largely dependent for its moisture and mucus on the efficient action of the salivary glands; and the oro-pharynx for its mucous coating and lubrication depends upon discharge coming down from the naso-pharynx. Dr. Sim Wallace was the first to emphasise the great value of mucus as an antiseptic and preventive of dental caries. Physicians have always laid great stress on the importance of looking at the tongue as a criterion of the proper performance of the gastric function. We have, as medical students, been schooled on this point, and the public expect the tongue to be looked at; it is a tradition, to neglect which would jeopardise a reputation for wisdom and carefulness. I think, however, that it would be much more helpful to look past the tongue at the posterior wall of the oro-pharynx and observe its coating, moisture, or dryness as an indication of the normal amount and quality of mucous secretion passing down from the naso-pharynx. If this surface is seen to be desiccated the stomach and œsophagus are not receiving an adequate amount of mucus to supplement their own supply, and should there be streaks of mucus adhering to the oro-pharyngeal posterior wall, it can be taken as a sure indication of a pathological change in the mucus-secreting function. Whether the tongue is clean or not is largely determined by the nature and consistency of the food and the amount of the salivary secretion. If the food is firm or hard, the attrition of the lingual dorsum on the surface of the palate keeps it clear of superfluous and deciduous epithelium, and so, what is called "clean." For a healthy, clean, aseptic mouth the chief requirements, therefore, are attrition, friction of the tongue, teeth, gums, and palate; and an abundant salivary secretion, one of the principal constituents of which is mucus, both as a lubricant and as a restrainer of sepsis. I consider that we do not realise sufficiently the value of saliva as the main antiseptic of the mouth and oro-pharynx. And it is also the chief lubricant and protection of the mucous lining.

The sublingual glands are entirely given up to the secretion of a mucous saliva. The submaxillary glands are principally mucus-secreting, although partially serous, while the parotid gland is entirely serous, secreting no mucus. Quarts of saliva are poured out into the mouth in the course of a day, and the total quantity of mucus thus secreted is very large.

In severe oral ulceration, ulcerative and necrotic stomatitis, Vincent's angina, and other intractable ulcerations of the mouth, it has been found very difficult to modify the bacterial flora by intensive treatment. This is due to the fact that the organisms found in the mouth have extended into its superficial layers, into crevices between the epithelial cells, and into the orifices of the mucous glands. These bacteria are very firmly lodged in the tissues, and chemicals applied to the mucous surfaces cannot effect sterilisation without also destroying the superficial layers of epithelium at the same time. The lymphatic layer of the mucous membrane is distinct in the mouth, although thin in the oro-pharynx, especially on the

posterior wall; but there are accumulations in places, emphatically so in the lingual and faucial tonsils. Both of these are simply a great thickening and heaping up of the lymphatic layers of the mucous membrane in the two situations. Over the tonsil the mucous membrane is very thin, being only a single layer of flattened cells; there are no mucous glands on the surface, and few on the tonsillar crypts. In both regions phagocytosis is very active, and the fact that the mucous covering is thin on the tonsil probably favours it. It is quite likely that pyorrhœa alveolaris is coincident with a shortage of salivary secretion, especially the more concentrated and viscid secretion of the sublingual and submaxillary glands. Pyorrhœa alveolaris is now considered by Goadby to be primarily a disease of the gums, owing to irritation and infection of the gum tissues around the necks of the teeth, and beginning with a mild but chronic infection of the gingival margin. I have recently observed two cases of salivary calculus in elderly people, when the mouth was very foul and there was much tartar on the teeth. The mouth in both was frequently very dry. It is safe to say that the salivary secretion was reduced; and it is not at all unlikely that this, and all the trouble (including the evident pyorrhœa) was due to salivary shortage.

In xerostoma, met with more commonly in women, where the mouth is dry and leathery and there is a great shortage of the salivary flow, the teeth are so affected that they crumble and fall out. This emphasises the invaluable rôle of the saliva, and especially the abundant mucin contained in it in the maintenance of oral hygiene. I think it is to be regretted that sialogogues have now largely gone out of fashion in our prescriptions; some of these I have found very useful, such as small doses of copper salts—ordering stout to be taken suffices as a sialogogue, as stout contains a small amount of copper salts. Jaborandi, and small doses of mercury, and potassium iodide, of course, are effective mouth-moisteners. Lobelia I have found useful in augmenting the salivary flow, and the sulphate in small doses often acts beneficially in asthma. This may be by modifying, and most likely augmenting, the mucous secretions which are lessened and perverted in this distressing affection.

THE CANCER PROBLEM.

Since three-quarters of all malignant disease arises on epithelial-covered surfaces, it is appropriate that a consideration of it should now command our attention. As before mentioned when discussing histological physiology of mucous membranes, everywhere in the healthy body there is found a separating material between the cells. Even the most closely approximated cells, such as the squamous cells on the surface of the vocal cords, are separated by intercellular cement material. Compare this state of things with the cells in an epithelioma. Here there is no separating substance whatever, but these cancer cells lie close together, and in the cell nests they are very firmly packed. Now this is a very striking contrast, and it is not at all unlikely that the rubbing shoulders, so to speak, of those cells sets up such a disturbance of the metabolism as to account for subsequent rapid division. Such cells have been said to be embryonic (rapidly dividing growing from within) and so the cancerous cell is supposed to have taken on the characteristics of the embryonic cell, and cancer is said to be a reversion to the embryonic condition. Certainly, the more the cancer cells resemble the embryonic cells, the more rapid the progress of their growth. In the ovum the cells divide with great rapidity after fertilisation has taken place. Symmetrical division goes on again and again until a mulberry-like mass of cells is formed—the morula. In this way arises a collection of small cells with no intercellular material whatever. A cavity soon appears in the morula, and the blastula is constituted—the cells now arranging themselves around the periphery and a group of cells forms at one pole, many of which are more irregular than those around the periphery. All are very rapidly dividing and soon become arranged in three layers—the ectoderm, the endoderm, and the mesoderm—constituting the blastoderm. The essential lesion of carcinoma is the penetration of cells into the surrounding tissues, but whether this new departure on the part of the cells is a result of a cellular change or of some alteration in the intercellular-resisting substance is not yet clear.

The probability is that there is a certain degree of both. In old age the intercellular material undergoes a wasting change, and as a result of this its resistive power against the ingrowth of epithelial cells is lessened and thus the onset of carcinoma is favoured, particularly as the overlying epithelium remains much longer active and thus there is an influence inducing the cells to penetrate inwards among the tissues. The centrosome, in cells on epithelial mucous surfaces, occupies that part of the cell nearest the surface and, therefore, the part most exposed to injury and irritation. The centrosome is the dynamic centre and plays the leading part in the division of the nucleus, the proliferation of the cell, and the regulation of movement.

Now, I believe that there is a long antecedent or precancerous stage in the development of cancer, and that during this time what occurs is a gradual removal of the intercellular cement material, and so bringing the cells themselves closer and closer together until they finally touch—juxtapose—and that this results in a friction or disturbance, and an irritation ending in a rapid cell division.

Perhaps the processes of irritation, such as occurs from paraffin and tar, which have resulted in the artificial production of cancer in mice and rats, act in such a way. In support of this contention, it is remarkable to note that cancer most often arises in regions where the epithelial cells are naturally surrounded most scantily by intercellular material—viz., on the skin surface, on the vocal chords, on the surface of the palate and its pillars, on the lips, &c., and in the breast.

It may be that two factors work towards the preparation of the tissues for the actual start of the carcinogenous change in any region, as I am persuaded from long years of study of cancer—first, gradual and continuous deterioration of health during which time the intercellular cement material, tissue-mucus, is absorbed or wasted; and secondly, a local change, most probably an irritant. That the cancerous growth is the result of some long-continued irritation is the oldest theory of all. The local production of cancer in mice and rats is a distinct advance. Researches on rats, in setting up the cancerous change on the squamous-celled surface of the stomach in the cardiac region are important, and prove that a surface covered with squamous cells is most susceptible, or, in other words, least resistant. This, I think, is due to the scanty intercellular material found in squamous covered surfaces. A new light was shed on cancer research when Johannes Fibiger, of Copenhagen, carried out his brilliant work on the production of gastric cancer in rats, showing that cancer was capable of being produced experimentally. In the sugar refineries of Copenhagen both cockroaches and rats swarm, and the rats eating the cockroaches developed a tumour in the cardiac end of the stomach (in this animal, covered with a squamous epithelium) which proved to be an epithelioma. The explanation of this result is that the larvæ of a nematode worm (thread-worm) pass a stage of development in the muscles of the cockroach, and this swallowed by the rat becomes fully developed in the squamous epithelium of the cardiac end of the stomach, thereby producing an epithelioma. Much has been done in the way of laboratory research, but experiment on animals, while helpful, is not going to induce us to lessen the intensity and incisiveness of our clinical work. I am very hopeful that much may yet be accomplished in our own specialty. We are warranted in such expectancy from the frequency with which the malady occurs in the throat, and the unique opportunity thus given us for clinical study.

A SIMPLE METHOD FOR THE PREPARATION OF INSULIN BY AQUEOUS EXTRACTION.

A Preliminary Communication

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THE investigations about to be described were undertaken with a view to determining whether any simplification could be effected in the method now in general use for the preparation of insulin. The method of Collip,[1] as modified by Dudley,[2] gives very satisfactory yields, but is admittedly expensive both from the point of view of alcohol and labour. For a five kilo batch of pancreas 13·5 litres of 95 per cent. alcohol, and 3 litres of absolute alcohol are required, whilst from the point of view of labour the supervision of an expert is required for practically the whole of the process which takes, on an average, about eight days.

In the first experiments of Banting and Best [3] water was used as an extracting fluid, but the yields were poor, owing to the unchecked action of destructive enzymes. After careful experiments alcohol was substituted for water, since it inhibited tryptic action, and at the same time extracted the active principle. From these experiments the method of Collip was elaborated. In a recent paper of Best and Scott [4] these writers refer to attempts at a more economical water extraction process, but out of 150 experiments made by them their best yields only amounted to a quarter of that obtained by their alcohol process. Perhaps the poor results can be attributed to prolonged exposure to tryptic action during the filtrations which, we have found, present many difficulties. Allen, Piper, Kimball, and Murlin [5] published a rapid method of insulin extraction using 1·5 N HCl as an extractor. They do not state their yields, however. We have tried this method but with little success.

Reduction of Tryptic Action: Separation of Insulin from Pancreatic Proteins.

Remembering that insulin is freely soluble in water and that this fluid forms its natural medium, we thought it highly probable that aqueous extraction would really be the ideal method, provided that tryptic action could be reduced to a minimum. In order that a water extraction process may give a satisfactory yield, the following points are essential. Firstly, reduction of tryptic action to a minimum; and secondly, efficient separation of insulin from the pancreatic proteins.

The first difficulty can be overcome by reducing the time of extraction to a minimum consistent with thorough extraction, and at the same time employing some inhibitory substance in the extracting fluid. Collip had suggested that formic acid was advantageous, hence it was thought that its addition to the extracting fluid would help in the inhibition of tryptic action. The second question regarding selective separation of insulin from the relatively enormous quantity of protein associated with it presents much greater difficulties.

The solution to this problem was indicated by the results of some experiments carried out in these laboratories on the relative solubility of insulin and protein picrates in organic solvents. Dudley [2] had previously shown that insulin picrate is highly insoluble in water. It was therefore a matter of great interest when we found that whilst the picrates of most proteins are sparingly soluble in moist acetone or alcohol, insulin picrate dissolves in these solvents with unusual readiness.* This fact overcomes the difficulty of separating insulin picrate in a highly concentrated form from the bulk of extraneous protein picrates precipitated with it; whilst Dudley's purification method provides the key to the regeneration of its hydrochloride from insulin picrate.

Experiments were at once commenced with a view to determining whether this could not be made the basis of a new process. Outlined briefly, the method consists of extracting the pancreas with aqueous chilled formic acid, and precipitating all the proteins from the fluid residue by the addition of saturated aqueous picric acid. The precipitate is filtered off and the moist picrates are extracted with acetone, thus dissolving out the insulin picrate. The acetone solution is filtered off, and the contained picrate precipitated by dilution with water and picric acid. This crude insulin picrate is filtered off and dissolved in acid alcohol after the method of Dudley, and, on dilution with acetone, the hydrochloride separates.

Technique of Method.

After many experiments and trials, the following method has been found to yield satisfactory results.

First Day.—Freshly collected pancreas is dissected to remove fat and extraneous tissue and weighed. The following description applies to a 5 kg. batch.

The pancreas is minced into 2·5 litres of 1 per cent. aqueous formic acid, which has been previously chilled to about −3° C. The mixture is well stirred at intervals, and allowed to stand for 10 to 20 minutes, after which it is poured on to a fine sieve, and as much liquid as possible is pressed out by hand. The fluid is received into an equal volume of saturated aqueous picric acid solution. The solid material retained by the sieve is pressed in "jean" and the expressed liquid added to the picric acid mixture. The solid material is removed from the press and is reminced into a further 2·5 litres of chilled formic acid solution, and the above process repeated, using a further quantity of the picric acid solution. This procedure is repeated a third time, giving in all a total volume of about 15 litres of the picric acid mixture. After the mixture has been well stirred and allowed to stand for ten minutes a portion is removed and filtered through a small folded filter and the clear filtrate tested for complete precipitation by the addition of more picric acid solution. Should a precipitate form, more picric is added to the main bulk. The precipitated picrates are then collected by filtration.

We have found the most rapid method to be preliminary filtration through folded Chardin filter papers, from which the wet precipitate is transferred to Buchner funnels. The total time taken by this procedure should not exceed two hours. The moist picrates are extracted two or three times by stirring thoroughly with acetone (about a litre for each extraction), pouring the pasty mass on to a folded Chardin filter paper, and finally pressing out through "jean." The clear acetone extract, which is of a dark-brown colour, is diluted with an equal volume of water. The precipitation of the picrate is completed by the addition of one volume of saturated aqueous picric acid, and the precipitate is allowed to settle overnight. This completes the first day's operations.

Second Day.—The clear, supernatant fluid is siphoned off and the picrate collected on a Buchner funnel. It occasionally happens that the picrate rises to the surface of the liquid, but this does not cause any inconvenience. It is washed with a dilute solution of picric acid and the moist picrate is converted into the hydrochloride by Dudley's method. For this purpose it is dissolved in acid alcohol prepared by mixing 25 c.cm. of 3N aqueous HCl with 75 c.cm. of alcohol. 10 to 20 c.cm. of this mixture are usually required for each gramme of picrate. By careful

* While this paper was being prepared for publication the authors learned in a private communication from Dr. Dudley that he had independently observed the solubility of insulin picrate in mixtures of water and alcohol, and that a paper by him, in which this observation is recorded, is now in the press.

rubbing with a glass rod, a turbid solution of a dark-brown colour is obtained, from which the hydrochloride is precipitated by the addition of 10 to 20 volumes of acetone. The hydrochloride is allowed to settle, and the clear supernatant fluid is decanted. The remainder is poured on to a Buchner funnel and the precipitate is washed with acetone until free from picric acid, and finally with dry ether. It is then dried in a vacuum desiccator overnight. The crude hydrochloride so obtained is a perfectly white, non-hygroscopic, amorphous powder, the rabbit unit of which usually lies between 3 to 6 mg. In some recent batches the rabbit unit has been as low as 1·5 to 2 mg.

Results.

The following are typical of the results obtained:—

1. *Exp. 8.*—Ox pancreas. Six kilos of dissected pancreas yielded 6·02 g. of hydrochloride. This was standardised in the usual method; 4, 6, and 8 mg. being given, and the rabbit unit was found to be 4 mg.

Rabbit No. 6, weight 2·2 kg. Blood taken at 7 P.M., 110 mg. per cent. Injection of 4 mg. in 1 c.cm. immediately after bleeding. Blood taken at 8 P.M., 59, at 9 P.M., 45, at 10 P.M., 48 mg. per cent. The total rabbit number of units was therefore 1504—i.e., 250 rabbit units per kg. The hydrochloride was then purified by Dudley's picrate process, and yielded 0·705 g. of pure hydrochloride. The rabbit unit of this was determined in the usual manner, 0·5, 1, and 1·5 mg. being given. It was found that 0·5 mg. was the required dose.

Rabbit No. 10, weight 2 kg. Blood taken 11 A.M., 125 mg. per cent. 0·5 mg. given in 1 c.cm. immediately after. Blood taken at 12.5 P.M., 33, at 12.55 P.M., 30, at 2 P.M., 42 mg. per cent. The total yield of purified hydrochloride, with a rabbit dose of 0·5 mg., was therefore 1400 rabbit units—i.e., 233 rabbit units per kg.

2. *Exp. 7.*—Pig pancreas. Two kilos of dissected pancreas. Owing to the fatty nature fully 20 minutes was allowed for each extraction. The yield of insulin was 1·346 g. On standardisation, the rabbit unit was 2 mg.; 1·5, 2, and 6 mg. were given to the rabbits.

Rabbit No. 5, weight 2 kg. Blood taken 2.30 P.M., 140 mg. per cent. 2 mg. immediately injected. Blood taken at 3.25 P.M., 66, at 4.30 P.M., 34, at 6 P.M., 40·8 mg. per cent. Convulsions at 4.30 P.M. The total yield was therefore 673 rabbit units—i.e., 337 units per kg. On purification by Dudley's method, yielded 0·232 g. of hydrochloride. The rabbit unit was found to be 0·3 mg.: 0·3, 0·6, and 1·0 mg. were given.

Rabbit No. 4, weight 2·3 kg. Blood taken at 10.15 A.M., 132 mg. per cent. Injection immediately of 0·3 mg. in 1 c.cm. Blood at 11.15 A.M., 34, at 12.15, 27, at 1.40, 55 mg. per cent. The total yield was therefore 773 rabbit units, or 386 per kg. This, it will be noted, is higher than the crude yield, the probable explanation being due to the inaccuracy of the rabbit methods of standardisation.

3. *Exp. 4.*—Horse pancreas. 4·5 kg. dissected pancreas extracted twice with 3 litres of 1 per cent. aqueous formic acid, yield of crude insulin 10·06 g. Rabbit unit 10 mg.; 10, 30, and 50 mg. were used.

Rabbit No. 3, weight 2·6 kg. Blood at 10.30, sugar 142 mg. per cent. Immediate injection of 10 mg. in 1 c.cm. Blood at 11.35, sugar 64, at 12.30, sugar 36, at 1.15, sugar 40 mg. per cent. The rabbit with 50 mg. had violent convulsions after two hours. The yield was therefore 1060 rabbit units—i.e., 235 units per kg. The crude hydrochloride was used for other purposes and was not purified.

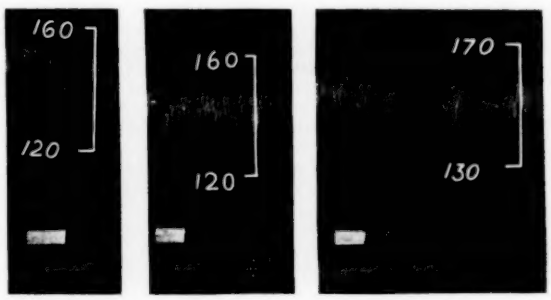
We have been able to repeat these experiments with consistent results, of which the above are typical instances. The yield has been steadily increasing with greater familiarity with the method.

As this process depends on quite different principles from the standard methods in use at the present time, it was thought necessary to test the possibility of a depressor effect. Prof. Swale Vincent and Dr. S. Wright very kindly performed blood-pressure experiments in the usual manner on two cats, the results of which we publish with their consent. The crude insulin hydrochloride made by this method was found to cause a very slight fall in blood pressure when injected intravenously. Twenty mg. containing 5 rabbit units caused a fall of 3 to 4 mm. (Tracing 1), but the purified hydrochloride was practically without depressor effect, as shown in Tracings No. 2 and 3. No. 2 represents the effect of 10 mg., No. 3 of 5 mg. of the purified hydrochloride, corresponding to 20 and 10 rabbit units respectively. The signal marks the time of injection.

These results are similar to those described by Dudley except in so far that the crude hydrochloride shows less depressor effect than crude insulin prepared by the alcohol process. Another important point is the question as to whether the final product contains any trypsin. To test this a previously standardised solution of hydrochloride was left in a 37° C. incubator overnight, and was re-standardised after incubation. The following are the details of the experiment.

The insulin made in Experiment 8 was used (see above). The rabbit unit, before incubation, was 0·5 mg. After incubation 1 c.cm., containing 0·5 mg., was injected into a rabbit with the following results: Blood at 11.5 A.M. 135 mg. per cent.; injection immediately after, blood at 12.5 P.M. 50, at 1 P.M. 40, at 2 P.M. 40 mg. per cent. From this experiment it is safe to conclude that the product is stable.

Blood-Pressure Tracings.



(1) crude ox 20 mg.; (2) pure ox 2 c.cm.; (3) pure ox 0·5 c.cm.

Insulin prepared by this method has been employed clinically on four human subjects and up to the present has been found quite satisfactory. No local reaction has been noted.

Conclusion.

This is intended merely as a preliminary communication. Many possible modifications suggest themselves. For example, improved yields might be obtained by distilling off in vacuo the acetone from the acetone picrate solution. Also the optimum concentration of acetone for the extraction of the picrates is now under investigation. From some experiments now in progress it appears that the insulin picrate might be fractionally precipitated from the acetone solution, thus yielding a purer product. Promising results have been obtained by alcohol and acetone alcohol extraction of the picrates. Modifications in the extracting fluid are also being investigated.

The object of publishing this preliminary note is to describe a workable water extraction process as an alternative to the lengthy and extensive alcohol extraction methods. The cost of materials in the present process is very small compared with that of the alcohol method, and the crude product can be prepared with ease in two days.

We wish to express our appreciation for the generous support of the Cancer and General Research Committee of the Middlesex Hospital. We have been in communication with Dr. Dale and Dr. Dudley of the scientific staff of the Medical Research Council and wish to express our thanks to them for their interest in this work, for information concerning details, at present in the press, of the method for the regeneration of the hydrochloride (included by their permission), and for many helpful suggestions with regard to the testing of the final product. The Medical Research Council also kindly provided facilities for the supply of pancreas used in these experiments.

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THE USE OF THE X RAYS IN ANTE-NATAL WORK.

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AND
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IF asked to name the besetting difficulty of the obstetrician engaged to attend a woman having her first baby we should describe it as the satisfaction of his own conscience that there was sufficient room for the baby's head to pass through the maternal passages. Anything that can lighten his burden in this direction achieves great public service and deserves the greatest publicity.

According to text-books, mensuration of the female pelvis is a comparatively easy matter, but anyone whose task is to be constantly endeavouring to estimate the relative sizes of the baby's head to the bony pelvis, very soon arrives at a different conclusion. The administration of an anæsthetic is recommended in doubtful cases, so that with a relaxed abdominal wall, one is more likely to be able to ascertain whether the head will enter the pelvic brim or not. But even here, we have found it most difficult in fat subjects, with a quantity of liquor amnii, to ascertain with anything like accuracy what was the true condition of affairs. It has been laid down by a well-known authority that often the only course to be adopted in borderline or doubtful cases is to allow a woman to go into labour and "wait and see." If serious difficulty is encountered, it is then one's duty to warn the mother that in future labours she will have either to submit to a Cæsarean section at full term or have an induction at the eighth month. Now, with the aid of X rays, a ready and easy means is provided for obtaining accurate knowledge of the size of the baby's head relative to that of the maternal pelvis. A glance at the illustrations, which have been traced from the radiogram obtained, will show that this is so.

An Illustrative Case.

The subject from whom Fig. 1 was obtained was a very fat and apprehensive female. It was extremely difficult to know what the presentation was. There was nothing to be felt per vaginam, for nothing had entered the brim. From abdominal palpation we thought it was a breech, but were not certain, as there was an enormous amount of fat, fluid, and fussiness. We had her X rayed and nothing indicative of the head was seen below, so we were confirmed in our belief that the case was a pelvic presentation. We then did a version by external manipulation and applied a tight abdominal binder. The next X ray picture (Fig. 1) showed that our manipulations had been successful, for the head here is now lying just above the pelvic brim. Without the aid of the X rays we were up against this difficulty. There was just the possibility of the presentation being cephalic, and we were loath to do a version in those circumstances, for there might be a chance of bringing about the very thing it was our endeavour to avoid. Without the aid of the X ray we confess we should have allowed the woman to go into labour with the baby presenting by the breech—hoping that our suspicions were not correct. That would have entailed extra risk to both mother and child. A breech often means for the mother a bad perineal laceration, sometimes involving the rectum, and for the child premature inspiration and the swallowing of amniotic fluid with its concomitant risks. As it was, the result of the birth was in every way satisfactory except for details now to be mentioned peculiar to this particular case.

The patient had entered the home in order to have twilight sleep administered. She waited for five weeks, and, as nothing happened, and as she had entered the tenth month since the first day of her last period, a few bougies were introduced under anæsthesia, and labour started 12 hours later. As is usual with induction cases, labour is inclined to be slow and tedious, and for this reason twilight sleep is contra-indicated in such cases. The birth of the head and shoulders showed that the presentation was a left occiput anterior. There was no tear of the perineum, and the child was in every way normal and uninjured. It is a useful preliminary to the introduction of bougies to give injections of pituitrin, 0·5 c.cm. night and morning for three consecutive days prior to their introduction.

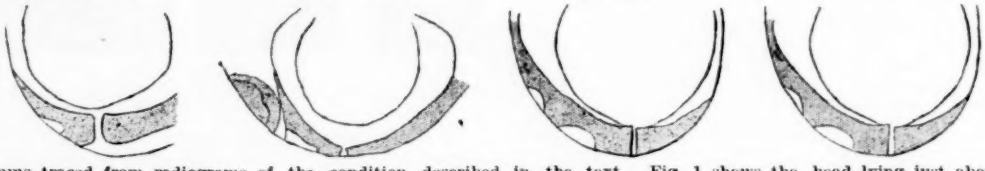
Cases Appropriate for This Method.

Our invariable custom now in a case about which we entertain any doubt—and to us there is always an element of doubt about any case of a primipara where the head is still above the brim of the pelvis during the last two weeks—is to have her X rayed. The knowledge so gained has proved of the greatest possible assistance. It is with a renewed sense of confidence and security that we then allow such a case to go into labour when the X ray has depicted an adequate disparity between the child's head and the pelvis, as, for instance, in Figs. 2 and 3. Only once in a fairly large number of cases now have we had reason to be at all disappointed with the X ray findings. Fig. 4 shows that although the head is lying above the pelvic brim there yet appears to be ample room for its passage into the cavity. We also believed so at the time, but subsequent events proved otherwise for there was a rather prominent sacral promontory. This entailed the application of forceps and a fairly hard tussle in order to get a well-ossified head past the obstruction. This difficulty has now been largely overcome by taking the photograph at a different angle, so that a view is obtained more directly down into the pelvis instead of a merely transverse view of the inlet, which can be so misleading when a well-marked promontory of the sacrum exists. A means now also exists of taking a radiogram of the outlet.

Another point about an X ray photograph is that some idea is obtained as to the amount of ossification the head has undergone, and that may be a real help in coming to some conclusion as to whether the child is overdue. It will be by the acquisition of this more accurate knowledge that X ray pictures undoubtedly afford, that the adoption of procedures suitable for particular cases will be more practised, and will render less exacting the life of the obstetrician.

Since writing on the subject of X rays in obstetric practice in 1922 [1] one of us (E. W. H. S.) has had the

FIG. 1. FIG. 2. FIG. 3. FIG. 4.



Diagrams traced from radiograms of the condition described in the text. Fig. 1 shows the head lying just above the pelvic brim. Figs. 2 and 3 show adequate disparity between the child's head and the pelvis. Fig. 4 shows that although the head is lying above the pelvic brim there is ample room for its passage into the cavity.

[1] THE LANCET, 1922 i., 860.

opportunity of examining many pregnant women with X rays. The technical difficulties have disappeared with practice, and it is now a quick and simple process to give the obstetrician the few simple facts which conduce to safe delivery. Formerly much time has been spent in devising a system of pelvimetry, but however accurately the pelvis was measured, we were still left in doubt as to the size of the head. What really matters is not the absolute but the relative measurements of head and pelvis; and these measurements are readily obtained by radiography, for it needs no special training to say whether the head will or will not pass through the pelvic canal.

We do not think we are overstating the case when we say that this is the only method yet discovered which can clear up all doubts on the subject. One of us (C. H. S. H.), who has had more than usual opportunities of judging, can testify to the value of this method regarding the position of the fœtus. As we have pointed out before, there is not the slightest risk to mother or child, the X ray exposure merely being that of any ordinary body examination, the fœtus being exceptionally well protected by the fluid. Furthermore, newly-born babies show complete immunity to ordinary X ray exposure. In 25 years' experience, one of use (E. W. H. S.) has never seen any X ray reaction, although one has continually to examine babies for swallowed foreign bodies, pyloric obstruction, or other causes. Another attraction, perhaps not a very important one, is that the examination is devoid of any of the disagreeableness associated with manual manipulation.

Regarding the time at which ossification makes the fœtus visible, we are of opinion that this will vary considerably. A recent case, systematically watched from the third month, only became visible at the beginning of the seventh month. Stereoscopy has proved of value in a few cases, and it is a matter of extraordinary interest to see the fœtal head and the surrounding bones in relief.

Clinical and Laboratory Notes.

NOTES ON TWO CASES OF HÆMOPERITONEUM DUE TO RUPTURE OF BLOOD-VESSELS IN THE GASTRO-SPLENIC OMENTUM.

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HÆMOPERITONEUM due to rupture of the blood-vessels in the gastro-splenic omentum following on an external injury is a rare occurrence; and these cases are recorded as they possess many points of similarity and general interest.

CASE 1.—Female, aged 5, admitted to the West London Hospital on Dec. 3rd, 1923, in a collapsed condition. This little girl was run over in the street by a milk-cart, the wheel of which passed over her abdomen.

Condition on Admission.—She was brought to hospital half an hour after the accident. Her pulse was then 160 and almost imperceptible at the wrist. Temperature 96° F., respirations—very shallow and rapid—about 44 to the minute. The child was dyspnœic, cyanosed, and restless. Pupils widely dilated. Many superficial abrasions were present. Small cut over right iliac fossa. Examination revealed no fracture of ribs, spine, or limbs. Thorax normal. The abdomen was "board-like" in its rigidity, and tender all over, but particularly on the left side. Shifting dullness detected in left flank. No decrease of liver dullness. Urine clear. As the patient appeared to be rapidly sinking, immediate cœliotomy was decided upon.

Operation.—This was performed about one hour after the accident, under ether, gas, and oxygen anæsthesia. Right paramedian incision 4 inches long. Peritoneum full of fresh blood, contained some large semi-solid clots in pelvis. The various portions of the gastro-intestinal tract were systematically examined and found to be normal. Urinary bladder, liver, and renal areas appeared intact. A small tear, however, was located in the gastro-splenic omentum, and a small spurting blood-vessel was identified, seized with pressure forceps, and ligatured. The abdominal cavity was then washed out free of all blood and clots, and about half a pint of hot normal saline was allowed to remain inside. The wound was closed up in the usual manner. During the operation 1 pint of normal saline was administered subcutaneously; and 1/120 gr. of strychnine hydrochloride was injected into the left ventricle during a temporary cessation of the heart's beat.

Although the patient was practicaly moribund after the operation, she rallied gallantly, and after withstanding a severe attack of acute bronchitis, made a good recovery.

CASE 2.—Male, aged 15, was "run over" by a taxi-cab whilst wheeling a barrow. He stated that one wheel passed over his abdomen. He was brought to the West London Hospital on Nov. 12th, 1923, about an hour after the accident, when he complained of severe abdominal pain, thirst, and difficulty in breathing.

Condition on Admission.—Temperature 97° F., pulse 112, respirations 22. The patient was very pale, restless, slightly cyanosed, dyspnœic, and sweating freely. Nothing abnormal detected in thorax. No clinical evidence of any fracture. Epigastrium very rigid and tender. Shifting dullness detected. Catheter passed. Urine normal. Five hours later, T. 97°, P. 130, R. 30. Vomited once. No blood in vomit. Rigidity of abdominal muscles more marked. Per rectum, tender.

Operation.—Ten hours after accident, under gas and oxygen anæsthesia. Right paramedian incision 3½ inches in length. Abdomen contained fresh blood and some blood clots. All abdominal viscera examined found to be intact. A diffuse bleeding area was discovered in gastro-splenic omentum. This area was firmly packed with gauze, one end of which was brought out into the left flank through a separate "stab" wound. The abdomen was then closed after removal of the large blood clots. The gauze packing was removed after 48 hours.

This patient made a gratifying recovery, and left hospital a fortnight after his operation. This case (No. 2) was admitted under the care of Mr. Donald Armour, and I am indebted to him for his kind permission in allowing me to publish his notes.

A CASE OF SMALL SUB-PERIOSTEAL FIBROMA OF THE TIBIA.

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THIS case of small sub-periosteal fibroma of the tibia caused much pain in the leg and localised tenderness.

A woman, aged 24, was admitted to Oakbank Hospital complaining of dull aching pain and slight swelling of the right lower limb of one year's duration. The pain, which was most marked over lower third of tibia, was also experienced in the hip- and knee-joints on movement, and was increased by the pressure of the bedclothes. Examination was negative save that the leg, which appeared to be slightly swollen, but did not pit on pressure, was exquisitely tender about the junction of the middle and lower third of the tibia. X ray photographs showed no abnormality of the bone, the joints appeared quite normal, and the Wassermann reaction was negative. Rest in bed did not alleviate the symptoms.

Operation.—An exploratory incision was made over the tender spot, and a small hard tumour, the size of a lentil, was removed from a depression on the surface of the tibia, underneath the periosteum.

The pathological report stated that the tumour presented the structure of a fibroma, with interlacing bundles.

The patient made a perfect recovery, the pain and swelling disappearing entirely, so that she is now fit for her regular work.

I am indebted to Dr. Janet A. O. Weir, resident at Oakbank Hospital, for the preparation of the report on this case.

Medical Societies.

MEDICAL SOCIETY OF LONDON.

A MEETING of this Society was held at 11, Chandos-street, Cavendish-square, W., on Feb. 11th, Dr. HERBERT SPENCER being in the chair, when a discussion was held on the

General Symptoms and Remote Manifestations of Common Affections of the Nasopharynx, the Nasal Accessory Sinuses, and the Throat.

Mr. HERBERT TILLEY, in opening the discussion, said that he would limit his remarks to conditions of inflammatory origin, and largely restricted himself to a demonstration by lantern-slides of the chief points of interest in his communication. Diseases of the nasopharynx, he said, were largely the pathological conditions which affected the lymphoid tissue of the post-nasal space. The well-defined but anatomically connected deposits of lymphoid or adenoid tissue grouped around the nasopharyngeal and faucial regions, forming what was known as Waldeyer's ring comprised the lymphoid tissue of the nasopharynx, the palatine or faucial tonsils, and the lingual tonsils. Lymphatic vessels passed from each of these to well-defined groups of cervical glands in the anterior or posterior triangles of the neck. There were also, in children, up to the third or fourth year, two pairs of lymphatic glands between the posterior wall of the pharynx and the anterior surface of the second and third cervical vertebræ. The common form of retropharyngeal abscess was the result of inflammation and suppuration in these glands. Histologically these lymphoid structures were essentially identical, and pathological conditions were rarely limited to any one of them. It was well-known that these aggregations were normal and well-defined structures in the earlier years of childhood, and that they exhibited a marked tendency to involution about the age of puberty and during the period of adolescence, but it was often forgotten that such a change might not take place, and consequently pathological conditions of these lymphoid collections were not uncommon in adult life. Their function scarcely came within the title of the discussion, but had an important bearing upon it.

Amongst other contributions the work of Kenelm Digby, Good (Chicago), and Dudley (Medical Research Council) went far to prove that the phagocytes of the tonsils, Peyer's patches and other sub-epithelial solitary lymph glands were continually ingesting the adjacent bacteria in the nasal and alimentary channels, and thereby constantly producing a healthily acquired immunity against various infections. It would be an extremely valuable piece of information if the medical officers of fever hospitals could show what sort of response to infection has been made by patients whose tonsils and adenoids had been completely removed in comparison with those who still possessed a normal amount of those tissues.

The lymphoid tonsillar deposits were well-developed in children. Their reaction to infection, as well as that of their associated cervical glands, suggested that they acted as protective structures in the first and second "lines of defence" respectively. At varying periods of time after complete removal of the faucial tonsils their recesses were occasionally seen to be partially occupied by lymphoid tissue which had grown up from the adjacent lingual tonsils. These were not a recurrence, but simply a pushing up of tissue into that place. In other instances prominent longitudinal deposits of a similar nature occupied the lateral walls of the pharynx. Quite recently he had seen a boy, aged 10, who four years before had his adenoids removed and tonsils enucleated. On the posterior pharyngeal wall there were the largest "granulations" of lymphoid tissue he had ever seen, which were probably the cause of the chronic "dry cough" from which relief was sought. Nature, apparently, had some very definite reason for placing sub-epithelial lymphatic tissue in those situations; thus such structures should not be sacrificed without more consideration than is often given to the question of their removal. Whether the constituents of Waldeyer's ring furnished an internal secretion akin to those of the endocrine glands was a view at present based rather upon theoretical considerations than on clinical observation and experience.

Effects of Inflammation.

With regard to the evil results which may follow when pathological conditions affect any one or more of the constituents of the lymphatic ring, the chief interest centred around the effects produced by inflammation arising from infection by pathogenic or pyogenic organisms, or both. The most frequent result, and especially after recurrent attacks of inflammation, was that hypertrophy of the lymphoid tissue known as "adenoids and tonsils"—i.e., the existence of an abnormal amount of lymphoid tissue in the nasopharynx and in the recesses between the faucial pillars. While hyperplasia was the usual result of inflammation during childhood it was important to bear in mind that pathological conditions might exist *without* hypertrophic changes, in which case the remoter manifestations were often more prominent than the local evidences of disease. Such considerations rendered it easier to answer the question, "What do we mean by *diseased* tonsils and adenoids?" The pathologist might hold that the mere presence of purulent debris and micro-organisms in their crypts and recesses was only an expression of physiological activity, while epithelial abrasions and the existence of polymorphonuclear leucocytes should be regarded as a surer sign of disease. The practical clinician would probably, and, he thought, rightly, maintain that the question could be answered only by an investigation of the history of the symptoms and of all the factors presented by the individual case.

Adenoids.

It was a common experience to meet this affection without a corresponding hypertrophy of the faucial tonsils, but less frequent to find the latter condition without some overgrowth of the nasopharyngeal lymphoid tissue. The general symptoms caused by adenoids might be divided into three categories according to the most prominent type of symptoms produced—viz.: (1) Those which indicate obstruction of the upper air passages; (2) local or remote symptoms of infection; (1) disturbance of reflex origin.

The Throat.

The commoner affections of the throat were due to inflammation of the palatine or faucial tonsils. The general symptoms of the commoner types of acute inflammation or tonsillitis were well known; their clinical manifestations were determined by the nature and virulence of the infecting organisms, their site of entry, and the resisting power of the patient. Other things being equal, the local and constitutional symptoms would be more severe should the predominating organism be a virulent type of streptococcus than in the case of staphylococcal or pneumococcal infection. The site of invasion had led to the recognition of at least three types of acute tonsillitis: (1) lacunar tonsillitis, where the brunt of the inflammation affects the crypts or lacunæ (often spoken of as "ulcerated sore throat"); (2) parenchymatous tonsillitis, in which the lymphoid follicles were acutely inflamed; (3) peritonsillitis or quinsy, where, while the tonsil was always inflamed, the characteristic lesion was inflammation and suppuration in the cellular tissues outside the capsule of the tonsil terminating in an abscess. This usually "pointed" in the soft palate above and to the outer side of the tonsil.

It was usual to recognise at least three types of chronic inflammation—viz., (1) chronic lacunar tonsillitis, where the crypts were filled with inflam-

matory products and swarming with micro-organisms; (2) hyperplasia of the lymphoid follicles, which produced large, soft tonsils of varying size and shape; (3) fibroid degeneration, in which connective tissue preponderated at the expense of the lymphoid elements.

Tuberculosis of the Tonsils.

As was the case in adenoids, tuberculosis of the tonsils was not infrequent, being latent and exhibiting no clinical signs of its presence. Philip Mitchell stated that of 64 children with tuberculous glands in the neck, 24 showed histological evidence of tuberculosis of the tonsils. The remoter manifestations of chronic tonsillitis were second only in importance to infective conditions of the teeth. In addition to ill-defined symptoms of impaired general health many definite and localised lesions had been proved to be due to a focus of infection in the tonsils. Such was the case with respect to fibrositis, myositis, and chronic arthritis.

The Nasal Accessory Sinuses.

These comprised the maxillary, ethmoid, frontal, and sphenoidal sinuses. The most common affections of these air-cells resulted from invasion by infective organisms, and the consequent inflammation assumed an acute, subacute, or chronic form. If the nasal accessory sinuses were methodically investigated during the post-mortem examinations of all cases of acute meningitis it would be found that a large number were the result of unsuspected infection from the sphenoidal and ethmoidal air-cells. Concerning the remoter manifestations of accessory sinus disease in adults it was his experience that gastric, pulmonary, and ocular symptoms are more frequent than cardiac, muscular, or arthritic complications. The constant swallowing or inhalation of septic matter is probably responsible for the first two. The pulmonary affections referred to are chronic bronchial catarrh, bronchitis, and not infrequently asthma. In consulting his physician for these complaints the patient often made no mention of a previous "chronic nasal catarrh," which only caused an inconvenience, because to him the pulmonary trouble is the real grievance. The great majority of chronic nasal catarrhs were really muco-purulent discharges from the nasal sinuses, and the infective micro-organisms which caused them would often be found in the patient's expectoration. Still more important was the fact that if the source of infection be removed its complications in the lower air-passages would often disappear without any special treatment.

Discussion.

The PRESIDENT expressed his appreciation of the caution advised by Mr. Tilley; in view of the tortuous cavities which had been so well illustrated upon the screen, operation in these cases was very difficult, and treatment of the conditions referred to should be left to specialists.

Sir HUMPHRY ROLLESTON said that the problems raised were on much the same lines as those in connexion with oral sepsis and formed part of the wider conception of focal infections. The common affections of the throat and naso-pharynx were especially prone to lead, by a process of direct spread, to disorders of the respiratory tract—laryngitis and bronchitis; a special form of this sequence of events was seen in post-operative lung complications, which in the past were often explained as pulmonary embolism; but according to Whipple, who called the condition pneumonitis, were commonly due to pneumococcus type IV. As with the teeth, so with the infections in the naso-pharynx and adjacent parts, a distinction between discharge into the alimentary canal on the one hand and into the lymphatic or blood-stream on the other hand, seemed important; the distinction must not, however, be pressed too far, for hæmatogenous infection, especially of the gall-bladder, might occur in the abdominal viscera. Much inflammatory disturbance of the tonsils, sinuses, &c., might exist, for a time at any rate, without any obvious general or remote manifestations. As in the more acute fevers, there was an incubation period, sometimes lasting for years, during which the process of sensitisation of parts of the body apparently took place. But as a cause of the sudden outburst of general or remote manifestations in a previously latent case of such a kind, the occurrence of a secondary infection must be admitted; and further, the chronic absorption of toxic products might have sapped the patient's powers of resistance and prepared the way for the new infection. The conception of local sensitisation of tissues, for example, of the articular structures, to toxins absorbed from the tonsils and sinuses was also of interest in connexion with Rosenow's view that bacteria have very special affinities for certain tissues, for example, streptococci from the tonsils are prone to select the joints, muscles, and the gall-bladder. A female patient, who was having a streptococcic vaccine, had attacks of biliary colic which seemed to be definitely related to the vaccines; the latter were stopped on the hypothesis that they set up cholecystitis in a sensitised gall-bladder. This stoppage was followed by cessation of the biliary attacks, and for six months all seemed well, but then the biliary attacks recurred and operation revealed numerous small calculi in the gall-bladder. The vaccine might have set up cholecystic reaction and extrusion of the calculi, but these alone might as a series of coincidences have caused the colic. A difficult point concerned with secondary or mixed infections of the throat was to distinguish between those which give rise to rheumatism—namely, manifestations held in check, if not abolished, by efficient salicylate treatment—and those which, not being thus restrained, were more virulent. Probably these conditions might occur together, and then at the best only a temporary improvement followed salicylate.

Dr. JOHN POYNTON dwelt on the connexion between tonsillitis and acute rheumatism. In 1900 he and Dr. Paine had isolated a diplococcus from the mitral and aortic valves of a case of heart disease, and had by means of this organism produced experimental rheumatic lesions. He looked upon the tonsils as a first line of defence, which might, if damaged, become a source of danger, in which case they must be removed. Removal, however, could not be relied upon to prevent further attacks of any particular condition. There was difficulty in defining a healthy tonsil, although much was known concerning infection. With regard to appendicitis, he had used a micrococcus from a boy with rheumatoid arthritis to produce experimental appendicitis, from which he had recovered the organism used. He showed slides illustrative of experimental appendicitis, pointing out how the infective organisms were taken up by the lymph cells, which were there shown to be exercising a defensive function. He also referred to the frequency of acute tonsillitis in leukæmia. He believed that some day the so-called blood diseases would be recognised as examples of abnormal reactions to forms of blood infection.

Sir STCLAIR THOMSON spoke of the extent of the subject, remarking that one evening could easily be spent in discussing the remote manifestations of infections of tonsils and another to those of infections of adenoids. Nasal obstruction, catarrh, and interference with breathing and swallowing were the chief symptoms handled by the specialist, and were therefore not included in the discussion. The specialist could, however, suggest two points to assist the family physician to recognise disease of the accessory sinuses: (1) a bad smell from the nose, observed by the patient; (2) the presence of pus, whether appearing in the nasal discharge or in the post-nasal space. He uttered a warning against too active surgery in the cases under discussion; it was advisable to operate "à froid," not "à chaud." He showed several slides of charts illustrating the prolonged fever sometimes caused by the presence of pus in the nose.

Mr. W. M. MOLLISON said that there was scarcely a disease for which the surgeon was not sometimes asked to remove the tonsils; he proposed to deal

only with nephritis as a result of tonsillitis. The surgeon was usually called in after the first attack of nephritis; albuminuria and hæmaturia generally increased immediately after operation for removal of tonsils, but later they disappeared. A. A. Osman had found that at Guy's Hospital, of a series of over 60 cases of nephritis, 55 per cent. had begun with tonsillitis. He (Mr. Mollison) recalled a case of a girl, aged 26, who had had two attacks of acute nephritis following acute tonsillitis. He had removed the tonsils, and heard two or three years after from the physician in charge of the case that the patient had had no further attack of acute nephritis, and showed a very slight degree of albuminuria. In other cases he had found albuminuria persist after removal of tonsils.

Dr. E. M. CALLENDER spoke of the pitfalls of the subject from the general practitioner's point of view. He agreed that Waldeyer's ring constituted a first line of defence against infection. He could remember no child in his own practice who had had the naso-pharynx cleared and had thereafter shown more liability to disease; if anything, he sometimes thought, these children were less liable to be infected than others. The general practitioner saw the beginnings of disease, but those beginnings were sometimes very difficult to recognise; he instanced a case where he had been called to a girl who was stated to be suffering from "a touch of sun," who presented only an ordinary febrile condition, only complained of a sore throat 24 hours later, and developed a tonsillitis 24 hours later still. During the war, in both England and France, he had been struck by the numbers of men with chronic otorrhœa; the latter seemed to go on all right with free drainage, but there was no free drainage in infections of the accessory sinuses. The most frequent form of such infections was the common cold—preventable, he thought, if taken before the bacilli were buried in the inflamed mucous membrane. He divided colds into those caused by *B. catarrhalis* and those caused by the pneumococcus.

Mr. E. D. D. DAVIS named many conditions for which he had been asked to remove tonsils. The tonsils, being specialised lymphatic glands, must always be examined before other less likely causes of illness were considered. Experience had not convinced him that colds were any less frequent after tonsillar operations.

Dr. WILLIAM HILL recalled that in his student days, before the discovery of the Klebs-Löffler bacillus, he was taught that albuminuria should be searched for in acute tonsillitis, and that if albuminuria was present the case was probably diphtheria rather than acute tonsillitis. He had found in his own experience that this idea would not fit in with facts.

Mr. TILLEY briefly replied.

BRIGHTON AND SUSSEX MEDICO-CHIRURGICAL SOCIETY.

A MEETING of this Society was held on Feb. 7th, Dr. ELIOT CURWEN, the President, being in the chair.

Prof. HUGH MACLEAN read a paper on the

Present Position of Renal Disease and Albuminuria.

He considered many of the older methods for testing the efficiency of the kidneys were of very little value, and at the present date unnecessary. The urea-concentration test—which is of a simple character, not expensive, and capable of being carried out by any general practitioner in a few minutes—was the most efficient and satisfactory. Albumin in the urine he did not consider so serious a symptom as was formerly thought. A small portion of the kidney might be disorganised, permitting the transudation of albumin, whilst the remainder was in a healthy condition and capable of carrying on the full functions. Rest and warmth are the chief lines of treatment. Washing out the kidney with large draughts of water he did not consider of much use as the kidney in the diseased state was incapable of excreting the water. Great reduction of protein food was not only considered unnecessary but in some cases harmful.—A vote of thanks was proposed by Dr. E. F. MAYNARD, seconded by Dr. R. SANDERSON, and carried unanimously.

Dr. H. M. GALT showed microscopical slides of (1) injected kidney, (2) normal human kidney (stained), (3) kidney in advanced interstitial nephritis, (4) kidney showing early amyloid change.

ROYAL MEDICO-CHIRURGICAL SOCIETY OF GLASGOW.

A MEETING of this Society was held on Feb. 1st, with Dr. A. MAITLAND RAMSAY, the President, in the chair.

Dr. A. E. MILNER gave a communication on the

Treatment of Lupus Vulgaris by the Diathermy Current.

After a brief description of the current and the form of apparatus used, Dr. Milner explained in detail the method he employed in the treatment of lupus vulgaris. The patient is placed on the condenser couch and the diathermy current turned on. The operator approximates a well-earthed electrode about the thickness of a darning needle to a distance of one-sixteenth of an inch from the part to be treated, when a succession of sparks passes from the patient to the electrode. A general anæsthetic is essential, and, of course, the danger of ether in the presence of sparks must be remembered. The area to be treated is first circumscribed by a ring of sparks, leaving about one-eighth inch of healthy tissue around it, and is then systematically cauterised over the entire surface. A dressing of calamine and bismuth cream is employed thereafter. A few cases are cured by one treatment, but usually two or three are necessary. The resulting scar is surprisingly good and scarcely noticeable. Should the scar be at all thick owing to previous treatment of the lupus with other methods, the application of X rays is effective. Dr. Milner had found that the most favourable case to treat was lupus vulgaris simplex, and emphasised the necessity of ensuring that every diseased part was accessible to the spark. He had found the results unsatisfactory in the cases where there was, in addition to the lupus, tuberculous disease of the mucous membrane of the nose, mouth, or lacrymal apparatus, as reinfection of the wound almost invariably took place.

The analysis of cases treated, excluding all cases in which the nasal or other mucous membranes were affected with lupus, was as follows: Total number of cases treated, 60; cases cured, 42; total number of operations performed on cases cured, 145; cured by one operation, 5; cured by two operations, 5; average number of operations on cases cured, 3·5; average time occupied in treatment of each case, 3·4 months. Time since cure was effected: Over 4 years, 1 case; over 3 years, 13 cases; over 2 years, 6 cases; under 2 years, 22 cases.

Dr. A. BRUCE MACLEAN described the results of the treatment of a variety of cases by

Medical Diathermy.

He had found the best results in the following types of case: (1) Fibrositis; where definite nodules can be felt. These nodes were usually rendered painless after a few applications, and often disappeared in a few weeks. (2) Neuritic pains and neuralgias; sciatica responded well to four to six treatments of about 40 minutes each. (3) Arthritis. Although little influence could be exerted on the disease, relief of pain could nearly always be obtained. (4) Circulatory disturbances; particularly those in which a

high blood pressure was the important factor, as the diathermy current had a marked influence in the reduction of the blood pressure. (5) Gynæcological cases—e.g., ovarian neuralgia, dysmenorrhœa, &c.

Dr. LAWRENCE STEWART, in the absence of Dr. JAMES R. RIDDELL, showed a series of cases of rodent ulcer treated by the diathermy spark.

ROYAL ACADEMY OF MEDICINE IN IRELAND.

SECTIONS OF MEDICINE AND SURGERY.

A JOINT meeting of these sections was held in the Royal College of Physicians of Ireland on Jan. 25th. The President of the Surgical Section, Sir WILLIAM I. DE COURCY WHEELER, was in the chair.

JAUNDICE.

In opening the discussion on this subject Mr. D. P. D. WILKIE (Edinburgh) said that he felt joint discussions were most useful, and he was of opinion that close coöperation between physicians and surgeons was essential. One form of hæmolytic jaundice was congenital, and it was the exception rather than the rule for surgeons to be called on in such cases. Removal of the spleen in cases of hæmolytic jaundice was being widely practised in recent years. He personally had performed this operation with great success in cases of the acquired type of hæmolytic jaundice, but these cases were relatively rare. He was of opinion that the diagnosis of jaundice cases was of the greatest importance, because the different forms of treatment were decided on according to the diagnosis. If a surgeon saw a case of jaundice which had been diagnosed as obstructive jaundice, he usually thought that it might be due to gall-stones, and at operation he looked out for these. Causes of obstruction of the bile-ducts other than stone or malignant disease were discussed, including pancreatitis and cicatricial contraction following such operations as cholecystectomy. When the gall-bladder was available and the obstruction to the biliary passages could not be removed, cholecystenterostomy, and particularly cholecystogastrostomy, gave excellent results. The operation of anastomosing the common hepatic duct to the duodenum was attended with considerable risk, particularly if the patient was very jaundiced, and the greatest risk was that of hæmorrhage. This could be diminished by decreasing the coagulation-time of the blood by means of intramuscular injections of 15 c.cm. of a 30 per cent. solution of sodium citrate into each buttock, following the method of Neuhof and Hirschfeld. These injections were painful unless preceded by a local anæsthetic such as novocaine. The method of lessening coagulation-time introduced by Lee and Vincent and advocated by Walters at the Mayo Clinic, by injecting 5 c.cm. of a 10 per cent. solution of calcium chloride three times daily for three days before operation, had not given satisfactory results in Edinburgh, and had been discarded in favour of the intramuscular injection of sodium citrate. Recently, blood transfusion had been done before operation, and if there was much bleeding after operation it was repeated. There was also the danger of hepatic insufficiency, as a result of which patients frequently did very well for the first few days after operation, but became ill about the third day and died soon afterwards in a state of coma. This could be guarded against to some extent by giving glucose by the mouth or subcutaneously, before operation: experiment had shown that life could be greatly prolonged in a dog deprived of its liver by giving glucose. Hot packs to the liver were useful in combating post-operative hepatic shock. Mr. Wilkie dealt in this connexion with the "white bile" which was found occasionally filling the bile-ducts and the gall-bladder in cases of obstructive jaundice. He described the fluid as crystal clear and approximating more closely the composition of distilled water than any other fluid found in any circumstance in the human body. When the obstruction was relieved in these cases and the patient lived, biliary secretion of normal colour and constitution reappeared within a few days. Coloured drawings were shown illustrating the effects of experimental ligations of the biliary ducts, demonstrating that "white bile" was a secretion of the ducts themselves, which sometimes, in the human subject, continued when the activity of the liver cells was in abeyance. Renal insufficiency also had to be considered.

The van den Bergh Test.

Dr. T. G. MOORHEAD said that from a physician's point of view jaundice was not a very satisfactory subject to deal with. A great deal had been learned in recent years concerning the pathology and ætiology of jaundice, but no real advance had taken place in its treatment. There was no gland in the body over which the physicians seemed to have less power, as far as remedies were concerned, than over the liver. He agreed fully with Mr. Wilkie that the most important thing for the physician to do was to arrive at an accurate diagnosis, and in this respect an advance had been made by the introduction of the van den Bergh test, but unfortunately, this test had proved less satisfactory than was at first hoped. Since the appearance of McNee's paper in the *British Medical Journal* of May, 1922, he personally, and many others, had been working with the test. It was at first hoped that it would enable the physician to distinguish between obstructive jaundice and toxic jaundice, but this hope had proved fallacious. Dr. Moorhead hoped, therefore, that further experience in or modification of the test would soon be produced. Where diagnosis was impossible he felt that an exploratory laparatomy should be performed, if conditions were not improving with the patient, after a lapse of some weeks. Even as a physician he would rather have an unnecessary laparotomy performed than fail to recommend one which might do good. He would like to add his testimony to that of Mr. Wilkie regarding the success of cholecysto-gastrostomy in suitable cases, and lastly, he would like to say that in many gall-stone cases, in which jaundice did not develop, operation was not essential.

Dr. ALFRED R. PARSONS referred to the van den Bergh test, and said that, as far as his own experience went, the test certainly demonstrated by the different reaction obtained that the type of bilirubin found in the blood in hæmolytic jaundice differed from that found in obstructive jaundice.

Practical Points in Prognosis.

The CHAIRMAN drew attention to certain practical points affecting the prognosis in cases of obstructive jaundice. He said that (1) surgeons in the past rather dreaded the possibility of post-operative oozing of blood into the general peritoneal cavity and recently papers were published indicating that probably a 58 per cent. mortality could be traced in part to slow intra-abdominal hæmorrhage. He referred to the recent work of Walters, Vincent, Lee, and others in administering calcium chloride to quicken the coagulation-time of the blood. Calcium also combined with the bile pigments in the blood-stream and so reduced toxæmia. (2) Much attention had been recently focused on the presence of white bile found in the ducts in cases of obstruction, and on the high mortality which followed any operative treatment in such cases. The term "white bile" was a misnomer; it was a colourless fluid secreted by the glands lining the ducts, and indicated hepatic insufficiency following obstruction. The patient might or might not be jaundiced, and thick, black bile was found in a non-functioning gall-bladder, the result of stasis. The bile had probably remained in the gall-bladder for a considerable time, and must not be mistaken for fresh bile passed into the gall-bladder from a functionating liver. (3) The prognosis was bad, he held, if bile did not appear soon after the establishment of drainage in cases of jaundice,

or if only a little came for a few days and then stopped. In these cases the prolonged back-pressure on the liver had probably caused such injury to the hepatic cells that there was cessation of function which, if not quickly restored, was followed by death. (4) A sudden flow of bile flooding the operative field in cases of obstruction gave anxiety. Such sudden relief of back-pressure had a similar effect on the liver as sudden relief of back-pressure had on the kidneys. The liver became engorged with blood as the result of sudden emptying of the bile-ducts, and the condition known as "liver shock" might follow a few hours after operation. In these cases surgeons endeavoured to decompress the liver gradually by keeping a clamp on the tube and allowing small quantities of bile to escape at regulated intervals.

The Chairman further referred to the reports he had made to the Academy of Medicine on the results of the Talma-Morison operation in 1904. In 1914 he reported a case referred to him by Dr. Parsons, in which tapping of the abdomen was resorted to with ever-shortening intervals until the patient became emaciated and confined to bed. At operation the liver was found fibrous, hard, and contracted to less than half the normal size. The operation did not cure the patient's weakness for indulgence in alcohol, but otherwise he remained well to this day. At the time when these early cases were reported, jaundice was considered a contra-indication to operation in cases of hepatic cirrhosis. Kocher, in his text-book, referred to the work done in Dublin in connexion with this subject, but thought that the operation, with certain precautions, would be successful even in the presence of jaundice.

The Rôle of the Spleen in Jaundice.

Considering recent work on the rôle of the spleen in cases of cirrhosis of the liver and jaundice, all were agreed on the excellent results which followed splenectomy in hæmolytic jaundice and Banti's disease; but it had not been so generally accepted that certain cases of cirrhosis of the liver responded satisfactorily to the same operation. According to Mayo, approximately one-fourth of the total blood in the portal circulation came from the spleen. A spleen over-burdened with toxic blood might deliver an unfinished product and be directly responsible for hepatic cirrhosis; and again, if cirrhosis arose independently, the hepatic cells which had a high power of regeneration might be relieved by stopping the blood flow from the spleen; the underlying principle being the same as in the Talma-Morison operation.

Dr LEONARD ABRAHAMSON said that for some time it was believed that infectious jaundice was due to associated infection of the bile-ducts, but latterly it had been found that these cases were really due to septicæmia. It was probable that the mode of infection was the blood-stream, and that if blood cultures were done sufficiently often, organisms would be found in the blood-stream. If cases of catarrhal jaundice were seen early enough, and blood cultures were done in every case, he thought it would be an advance in the treatment of jaundice. In French schools they thought that there were three types of jaundice: (1) the definitely obstructive type; (2) the definitely hæmolytic type; and (3) the toxæmic type. Cases of jaundice were often seen in which there was retention of the bile-pigments, but no retention of bile-salts, or in which there was retention of the bile-salts, and not of the bile-pigments. Up to the present, there was really no good test for liver insufficiency. He would like to know if in cases which were operated on for jaundice horse serum had any value in preventing hæmorrhage. He had seen horse serum given in one case only, but in that case there had been practically no hæmorrhage. Urobilinogen was found frequently in the urine of jaundiced patients, and he believed this showed liver deficiency. Cases of heart failure in which there was definite jaundice were generally fatal, and he would like to know what the actual cause of death in such cases was.

Mr. C. J. MACAULEY said that, in his opinion, surgeons were too inclined to take over a case straight from a physician and operate at once without being confident enough of the diagnosis, and commented on the points which had been raised about renal insufficiency and hepatic insufficiency.

Dr. HENRY MOORE said that in nearly every case of jaundice in his experience bile was found in the stomach contents at some time during the three-hour period, and yet in some cases he had come across the bile did not seem to cause the patients very much inconvenience. He quite agreed with Dr. Abrahamson that there was no very reliable test for liver insufficiency. He believed a new test had recently been invented by the Americans. He did not think much information could be got by testing substances, he would rely more upon functional tests.

Sir WILLIAM TAYLOR said he thought that in a great many cases the bad effects after operation could be avoided if more care was taken in diagnosis. He did not agree with Dr. Moorhead that a patient with gall-stones should not be operated on. He would operate on every case of gall-stones, provided the patient had sufficient symptoms to justify a definite diagnosis of gall-stones.

UNIVERSITY COLLEGE, CORK, SCIENTIFIC AND MEDICAL SOCIETY.

Exhibition of Cases and Specimens.

A MEETING of the Medical Section of this Society was held on Jan. 29th, with Dr. D. MORRISSY in the chair.

Dr. J. B. HORGAN presented a case of mastoid suppuration in a male aged 30 years, which illustrated the difficulties of diagnosis of a suspected lateral sinus thrombosis. Symptoms and temperature showed no abatement some three days after a radical operation for the relief of an acute exacerbation of a chronic suppurative otitis media. Examination of cerebro-spinal fluid showed a normal fluid, the lungs were normal, and examination of the blood gave no indication beyond a relative preponderance of polymorphs in an otherwise normal white-cell count. There were no rigors or chilly feelings. The temperature still running an intermittent course, a blood culture was made in which streptococci were obtained in pure culture. The internal jugular vein was ligatured and resected, and the lateral sinus was found to contain a septic thrombus some 2 inches long. On removal of this with obliteration of the sinus and administration of antistreptococcus serum the patient made a complete if tardy recovery.

Dr. H. COTTER presented a case of separation of the upper humeral epiphysis without displacement, and with an almost negligible history of injury. A radiogram was shown in illustration of the condition which was remarkable in that symptoms of pain and a coarse crepitus were first complained of two months after injury, and were possibly due to organisation of an effusion into the joint capsule.

Dr. R. C. CUMMINS demonstrated two cured cases previously shown before treatment had been instituted. They were, respectively, kerion of the beard treated with a mercurial ointment and staphylococcic vaccine, and a lupoid syphilide of the circumoral region.

Dr. N. MARSHALL CUMMINS presented a case of congenital defect in the ventricular septum. This was remarkable in that the patient was 30 years old, had never complained of cardiac distress, and had never been ill in his life. Cyanosis, polycythæmia, left ventricular hypertrophy, and a loud systolic murmur with maximum audibility at the fourth left interspace radiating into the neck, arms, and over the chest posteriorly, were all present.

Messrs. William Heinemann (Medical Books), Ltd., announce the forthcoming appearance of "Insulin in General Practice," by Dr. A. Clarke Begg, written entirely from the clinical standpoint.

Reviews and Notices of Books.

PSYCHO-ANALYSIS.

A Critical Examination of Psycho-Analysis. By A. WOHLGEMUTH, D.Sc. Lond. London: George Allen and Unwin. 1923. Pp. 250. 10*s.* 6*d.*

EXCEPT for the work of MacCurdy and Rivers, there has been little effective criticism of psycho-analysis, and the student will open Dr. Wohlgemuth's book with the expectation of finding help in sifting the wheat from the chaff. The author soon settles down to consider fundamental questions and asserts that to talk about psychic facts before and after the stage of "awareness" is surely nonsens cal, for the essential of a psychic fact is just this awareness. But many observers have found themselves obliged to assume that mental processes take place without the subject being aware of them, and the author's dismissal of this assumption as nonsensical is a *petitio principii*, though he tells us that psycho-analysts produce not a shred of proof, only assertions. One seeks for evidence that he has followed the same methods that these observers have followed, but, unfortunately, it is not easy to tell when he is "guying" the methods and when he is producing evidence meant to be taken seriously. He attempts by introspection to discover within himself particular tendencies which Freud claims to be present in every normal man, and on failing he remarks that Freud and his followers will retort that the experiments merely prove that no such tendencies are *conscious* in him, which is precisely what the experiments do prove. Since psycho-analysts postulate that such tendencies cannot be discovered by unaided introspection, the experiments have little bearing upon the subject and are not strengthened by the addendum that "their psycho-analytic method merely discovers in the patient what the psycho-analyst has been putting there himself," which is another *petitio principii*. The clinical experience of the results of the revival of lost memories, a method which as applied to war cases led many workers to accept the theory of the unconscious, is dismissed by a comparison with Mesmer's "salutary crisis" and the statement, without references, that "some authorities have pronounced themselves against this method in no equivocal manner."

There are, as would be expected from a psychologist of Dr. Wohlgemuth's standing, many sound criticisms to be found in the book. Some of the mystical and fantastic developments of psycho-analysis provide the author with points for effective attack, and he is not slow to detect important inconsistencies between the opinions of Freud and of Ernest Jones, his well-known disciple in this country. But he sets out to prove too much. It is too late in the day to say that psycho-analysis is a confidence trick, or that psycho-analysts are moral voyeurs, and the joke about psycho-analists on pp. 205 and 224 has lost its freshness. The book may afford pleasant reading to those who like to see psycho-analysis smitten hip and thigh, but it is not a sober and dispassionate examination of Freud's teachings.

Psycho-Analysts Analysed. By P. MCBRIDE, M.D., F.R.C.P.E., F.R.S.E. With Introduction by Sir H. BRYAN DONKIN, M.D. Oxon., F.R.C.P. London: William Heinemann (Medical Books) Ltd. 1924. Pp. 142. 3*s.* 6*d.*

Dr. McBride submits psycho-analysis to such criticism as he considers it to merit and arrives at certain conclusions, the first two of which are: that the whole scheme rests upon pure hypothesis or a series of hypotheses, and that these hypotheses "are so improbable as to vitiate their use as legitimate premisses." Upon these conclusions it follows naturally that it is unjustifiable to deduce from the hypotheses a method of treatment, and that, where this has been done, no evidence of success is forthcoming. There is nothing more important for the progress of medicine than submission of medical theories to criticism, but we do not find in this short series of chapters the broad outlook or unbiassed attitude which makes such criticism helpful. With other of the conclusions to which readers are invited to assent we could agree or partly agree, or from them could differ to a greater or less extent, without finding ourselves compelled to condemn in uncompromising language the practice of psycho-analysis. Certainly this practice has been exploited by some in an unworthy manner, but we feel that the author of "Psycho-Analysts Analysed" has entirely failed to demonstrate that no good has or can ever emerge from it.

NUTRITION.

Nutrition and Clinical Dietetics. Third edition. By HERBERT S. CARTER, M.A., M.D., Assistant Clinical Professor of Medicine, Columbia University, New York; PAUL E. HOWE, M.A., Ph.D., Associate, Rockefeller Institute for Medical Research; and HOWARD H. MASON, A.B., M.D., Associate in Diseases of Children, Columbia University. Philadelphia and New York: Lea and Febiger. 1923. Pp. 731. $7.50.

THE third edition of this excellent American work on dietetics has several improvements and additions. Much has been added in the chapter on Vitamins, which has been brought thoroughly up to date, while the discussion of the feeding of children has been enlarged to include the results of the recent critical survey of the subject by Holt and Fales in the United States. Recent work in connexion with the investigation of rickets and an account of Pirquet's "nem" system of feeding have also been included. In the section on Clinical Dietetics there is an interesting discussion of the subject of the ketone-antiketone properties of foods in their relation to diabetes.

Nutrition: The Chemistry of Life. By LAFAYETTE B. MENDEL, Sterling Professor of Physiological Chemistry, Yale University; Research Associate of the Carnegie Institute of Washington, D.C. Yale University Press. London: Humphrey Milford, Oxford University Press. 1923. Pp. 150. 14*s.*

THIS charming little book, the subject-matter of which formed the Hitchcock Lectures delivered at the University of California, will be welcomed by a large number of readers. The author is one who speaks with authority on this subject, and has dealt with it in an entertaining manner. The historical matter will for the most part be new to many, and serves to show how greatly and how rapidly the subject has developed. There are five chapters, the first is a retrospect, the second deals with the importance of "little things" in nutrition, the third with the vitamins, the fourth with the protein factor in nutrition, and the last with the energy problem in nutrition. The book is logical, the story is well sustained, and the style interesting, while good illustrations are numerous. Our congratulations to the author on a really excellent book.

DISEASES OF THE EAR.

Third edition. By PHILIP D. KERRISON, M.D., Junior Aural Surgeon to the Manhattan Eye and Ear Hospital. London and Philadelphia: J. B. Lippincott Company. 1923. Pp. 614. 35*s.*

THE publication of a third edition of this book within three years of the appearance of the second edition is proof of its popularity, which is well deserved. It is a model of what a text-book should be, for it contains a careful and thorough description of examination methods, providing elementary knowledge which the student should and the practitioner must possess, and gives details about the more obscure conditions which the specialist requires. In this edition there is but little change

in the substance of the work. A new and valuable chapter has been added on tumours of the eighth cranial nerve, based chiefly on Prof. Cushing's series of cases. The recent work on the otolith apparatus by Magnus and de Kleijn is just mentioned; a short abstract, sufficient to indicate its scope, would have been welcome. On the subject of cochlear function Wrightson's theory of audition and Gray's theory of maximum stimulation now receive mention, and, under the ætiology of otosclerosis, also Gray's degeneration theory.

The book is well illustrated, and is one of the best text-books on the subject we have seen.

TUBERCULOSIS.

Pulmonary Tuberculosis: its Diagnosis and Treatment. By JOHN GUY, M.D., D.P.H. Camb., F.R.F.P. & S. Glasg., F.R.C.P. Edin. Edinburgh: Oliver and Boyd. 1923. Pp. 307. 16*s*.

THIS book is intended primarily for the student, but the author hopes it may be of some use to the practitioner wishing to refresh his knowledge. It should fulfil both purposes well, although the practitioner may, perhaps, find the chapters on treatment comparatively short. But the author is well advised in devoting so large a section of his book to diagnosis, and the various means by which the disease can be detected early. The practitioner will often find that early diagnosis and simple rest treatment will save the patient from the need for the tinkering and symptomatic treatment the advanced consumptive is usually given. It is a sign of the times that the treatments to which the author gives most prominence are sanatorium treatment and artificial pneumothorax—measures neither of which comes, as a rule, within the sphere of the practitioner. He will assuredly again come into his own when he diagnoses the disease before gross changes occur.

With regard to tuberculin, the author does not consider the case for it to be proven, and he notes that the present consensus of opinion is against it. There is nothing so important in the diagnosis and treatment of tuberculosis as the scientific use of the clinical thermometer, and it is disappointing to find the author to be vague in his references to temperatures. On p. 227, for example, he writes: "If fever be present, and the temperature reach 100° F. in the morning, this period in bed should be extended indefinitely." On the next page he writes: "In sanatorium practice it is an almost invariable rule that a patient with either a morning temperature of 99° F. or an evening one of 100° F. (rectal) should rest all the following day." Readers unfamiliar with sanatorium treatment might assume wrongly from these words that if the temperature were a few tenths below the figures given, rest in bed was not indicated. In the chapter on Difficulties of Diagnosis he is to be congratulated on his condemnation of the authority who "plumps for" a diagnosis of tuberculosis on inadequate evidence. He gets the credit for early diagnosis, but many a non-tuberculous person struggles for the rest of his life under the stigma of tuberculosis. The author's advocacy of employing all the most searching modern diagnostic methods is most timely, and in this respect, as well as in many others, his book should prove of value.

Rules for Recovery from Tuberculosis. Fourth edition. Thoroughly revised. By LAWRASON BROWN, M.D. Philadelphia and New York: Lea and Febiger. 1923. Pp. 217. $1.50.

THIS is an old friend. Several changes have been introduced, vitamins being briefly discussed, and several new suggestions being made in the chapter on foods. Throughout the book numerous minor amendments have been made in an attempt to keep it abreast of modern knowledge. But there are no revolutionary changes, and this is all to the good, for the earlier editions have been most excellent. Ostensibly, this book is for the guidance of the patient, but were every physician to study it with the attention usually reserved for larger and more pretentious works, the standard of treatment of tuberculosis would undoubtedly be raised. The author possesses the rare combination of facility of diction and the capacity to condense important information, and the reader should be careful not to skim the book, failing to note that there is some profound truth in almost every sentence.

SCIENCE AND THE FUTURE.

Dædalus. By J. B. S. HALDANE. London: Kegan Paul, Trench, Trübner and Co. 1924. Pp. 93. 2*s*. 6*d*.

"WONDERFULLY clever and I daresay mostly true," as Darwin said when he had been reading Herbert Spencer.

In this bright and witty book the Reader in Biochemistry in the University of Cambridge exercises an admirable faculty of being serious without being solemn in telling of his dreams of what scientific progress will bring. Chemistry and physics will proceed on their way; cheap power will be collected by windmills and stored as hydrogen made electrolytically from water; food will be made in factories, carbohydrates from cellulose, proteids from coal and free nitrogen; space and time will be minimised in various directions. But the future really lies with the biologist, who alone can make man what he should be—body, soul, and spirit. We are at present almost wholly ignorant of biology, which makes us too modest in our estimates of what it may achieve in the future: once it can disentangle generalisations of the order of those which have lately been tumbling over one another in molecular physics we shall realise what its potentialities are. As a small example the author gives us the production of children in vitro: a good ovary will produce an egg a month under suitable conditions, and most of them can be fertilised and grown successfully in artificial solutions for nine months and then brought out into the air. These ectogenetic children will restore the populations depleted by the success of preventive campaigns, and the ova and spermatozoa can be so selected that the very best products can be guaranteed. So shall science ultimately achieve its aim—that man should conquer space, time, and matter, and then his body, and finally the evil in his soul. "The open secret my door discloses Is fairer than God or woman or roses," as the author says elsewhere.

Mr. Haldane's essay can be heartily commended for general reading, even to those who saw its substance in the *Century Magazine* for August, 1923—a previous publication which does not seem to be mentioned in the present version.

THE ELEMENTS OF PUBLIC HEALTH ADMINISTRATION.

By G. S. LUCKETT, M.D., Director of Public Health, New Mexico; and H. F. GRAY, B.S., M.S., Chief of Division of Sanitary Engineering and Sanitation, New Mexico. Philadelphia: P. Blakiston's Son and Co. 1923. Pp. 460. $3.

THE authors explain that, in the autumn of 1919 they were called upon to help in the construction of an entirely new State health department, where no organised central health agency had previously existed. This book is in no wise intended to supplant the more comprehensive text-books, but rather to furnish a handy manual of practical suggestions for the use of the practising physicians appointed as part-time health officers in the various districts, many of whom had been necessarily out of touch with modern health agencies for years. We should imagine that the book fulfilled its original purpose admirably, and will prove of practical value to many new health officers of small communities. To British readers the book will prove of interest, as showing the difference in methods which have to be adopted in such a country as New Mexico. For example, there is no mention of hospitals for infectious disease or sanatoriums. Part I.

deals with public health administrative measures. Part II. deals with a large number of preventable diseases, including many which are met with in the Southern States, but which cannot, as a rule, concern the British medical officer of health; these include Malta fever, hookworm disease, beri-beri, pellagra, Rocky mountain spotted fever, and dengue. Part III. consists of appendices on various subjects, such as a plan of county health work, instructions to public health nurses, a curriculum for midwives, a dairy score card, the technique of the Schick test, disinfection and delousing methods.

No doubt the British sanitary officer will find much of interest in this volume.

CYTOLOGY.

The Physical Basis of Life. By E. B. WILSON. New Haven: Yale University Press. 1923. With 20 figures in the text. Pp. 51. 7*s.*

THIS is the first William Thompson Sedgwick memorial lecture given in the Massachusetts Institute of Technology to commemorate that distinguished and loved biologist and hygienist. It is a survey, in general terms, and addressed to a wide biological audience, of the present state of knowledge of cell structure and its significance. Prof. Wilson is a convinced mechanist, though he is not concerned to argue the matter here: he has taken the title of a famous address of Huxley's which, as he says, put a spell on him when he was a college student, and he points out how the "protoplasm" which was then the physical basis of life has since been dissected with the discovery of a great variety of organs, first mostly in the nucleus, in more recent times in the cytoplasm too. He might as well have called his lecture "The Cell in Development and Inheritance"—a book which has enthralled many an undergraduate, and which has unfolded in such a wonderful way of late at the hands of his colleagues at Columbia. We are glad to see that a new edition—about 20 years overdue—is in preparation.

SURGICAL "DON'TS" (AND "DO'S").

By C. HAMILTON WHITEFORD, M.R.C.S., L.R.C.P., Hon. Surgeon to the Plymouth Infirmary. London: Harrison and Sons, Ltd. 1923. Pp. 46. 3*s.*

THE sprightliness of the title of this booklet does not get lost in any of the ten short chapters it contains. They have been published elsewhere from time to time during the past 13 years, the first being a paper read in 1910, the last being written in 1923. Many of the "Don'ts" are useful, isolated scraps of advice, but there are a few "Don'ts" which recur throughout the booklet with certain variations, and which give a clue to what are the author's pet aversions. "Don't overrate the importance of manual dexterity." Further on he urges his readers not to confuse the operator with the surgeon. The operator's "sole asset" is his manual dexterity; he is happy only when operating, and is a distinct danger to the public. The surgeon, on the other hand, knows when not to operate. "The war has produced a copious crop of operators, but has not correspondingly increased the supply of surgeons." Some of the "Don'ts" verge on the superfluous and are hardly polite. "Don't have anything to do with secret commissions," is a warning which, like Do not commit adultery, might be taken for granted. There is one curious "Don't." It runs: "Don't accept the position of honorary surgeon to a doctor and his family, when you are never asked to attend to the surgical needs of his patients. Actions speak louder than words, and the implication, obvious and illogical, is that you are considered capable of undertaking gratuitous attendance on the doctor and his family, but incapable of treating his paying patients." The ethics of this advice are rather doubtful, but perhaps the author could a tale unfold to justify this. Most of the advice given is sound and some is witty, and the recently qualified medical student will find here much knowledge as well as mirth.

The Conduct of Medical Practice.

A Series of Articles by Experts dealing with the Difficulties Encountered in Professional Life and How to Meet Them.

VII.—ACTIONS FOR DAMAGES: ERRORS OF TREATMENT.

BY HUGH WOODS, M.D., D.P.H.,
GENERAL SECRETARY, LONDON AND COUNTIES MEDICAL PROTECTION SOCIETY.

.... being in,
Bear't, that the opposèd may beware of thee.
—*Hamlet*, Act I. Sc. 3.

WHEN every proper precaution has been taken against the risk of claims for damages founded on alleged wrong diagnosis, there still remain the risks that arise out of accusations of wrong treatment. The same condition or ailment is by no means always treated in the same way by different practitioners. Modes of treatment apparently quite different may be equally good, or opinion may be equally divided as to which is the best, or the mode of treatment approved by a distinct minority, or even by a single individual, may in fact be the best. Nevertheless, a judge and jury, who know little or nothing about it, are apt to regard any departure from the recognised routine treatment as being due to careless neglect to observe the ordinary rules of medical practice, and if a number of medical witnesses all admit that the treatment was not that which they would themselves have adopted, it may be unhesitatingly condemned even though quite suitable and quite carefully and deliberately adopted.

Safeguard of Consultation.

When a case presents special difficulties, or appears likely to have an unfavourable result, it is a great safeguard to call another doctor into consultation, and preferably one of high standing in the profession, or a specialist in cases of the kind. Here again the question of expense may have to be considered, and if it is objected to, the medical attendant will be well advised to provide himself with clear evidence that he had advised the calling in of a consultant, and that the responsibility for its not being done rests with the patient or the responsible relatives. Where medical assistance is desirable it should be asked for. If an operation is undertaken single-handed, and some mishap occurs which might conceivably have been avoided if another doctor had been present, the operator may be regarded as guilty of negligence in not insisting on medical assistance before undertaking the operation.

The Giving of Anæsthetics.

It is seldom right to attempt to operate and anæsthetise at the same time. In midwifery cases it is not uncommon for a doctor to administer an anæsthetic and to instruct a nurse to continue the administration while he uses the forceps or performs some obstetric operation, and it is sometimes not easy or perhaps practicable to do otherwise; but if any mishap occurs the doctor will run the risk of being mulcted in damages unless he can prove that there would have been greater danger in waiting until medical assistance had been procured. When there is no need for haste, and the operation can be safely and properly deferred till a qualified anæsthetist can be obtained, it is not advisable to undertake the dual responsibility.

Operation in Presence of a Third Person.

Again, it is seldom wise to perform even the more trivial operations without some responsible person being present. The experience of a patient fainting, or collapsing seriously under an operation, with imminent danger of sudden death when no one else

is present, will make a doctor very reluctant to place himself in a similar position a second time. It is desirable to have notes of cases dealt with, but in a busy general practice it is exceptional for any record to be kept of anything beyond the visits and consultations and the medicines prescribed. Prescriptions should always be recorded, especially when any poisonous drug is prescribed, whether the doctor dispenses his own medicines or not.

Delayed Complaints.

It quite often happens that no complaint of any kind is made of the treatment of a patient until, perhaps after the lapse of a year or two, the patient is informed that steps will be taken to enforce payment of the fees which remain unpaid notwithstanding the frequent rendering of the account. Then grave charges of negligence or wrong treatment are launched and payment is refused with a threat of action for damages. The doctor tries to recollect the case, and searches for any record of it, but the whole final result often amounts to a strong personal conviction that there is no foundation for the accusations, and to nothing more. Under such circumstances it needs not a little courage to go into court, and the unscrupulous patient, quite appreciating the situation, knows that he has a very good chance of escaping payment although he has no grounds whatever for his complaints. If the doctor does not sue for his fees it may encourage his patient to venture on a speculative action for damages, or he may content himself with boasting that he accused the doctor of negligence and refused to pay him and that the doctor was afraid to go into court.

Exaggerated Importance of Many Claims for Damages.

Threats of actions for damages against doctors are very common, and although they should be taken seriously they ought not to be feared in the great majority of cases. The object of such threats is usually to avoid payment of fees, and sometimes it is a comparatively safe method of attempting to blackmail. A firm attitude is essential, and great care should be taken not to spoil a good case by hasty replies inspired by indignation or alarm. Many doctors have an exaggerated idea of the harm that may be done to their practices by actions for damages. In many cases, even when damages are awarded against them, the advertising influence of a case of public interest and the sympathy aroused among their friends and neighbours may more than counterbalance any ill-effects, if the evidence does not disclose clearly reprehensible conduct, or make them appear incompetent, ridiculous, or contemptible. What makes actions for damages pecuniarily unsatisfactory is the fact that in most of the cases the plaintiff, when he loses his case, does not pay the defendant's costs, and consequently a successfully defended action involves heavy loss to the doctor, although, of course, such loss is lighter than if he had lost the case. The anticipation of such a result is not unlikely to weigh too heavily with a medical practitioner of scanty means if he has to defend himself, and it may lead him to yield to unjust demands to the encouragement of dishonest persons who seek to prey on medical men. In modern times it is to be feared that the law courts occasionally afford an effective means of dishonestly extorting money, because it is often cheaper to buy off a plaintiff than to defend an action successfully and pay the heavy costs of a barren victory.

Claims Suitable for Reasonable Settlement.

There are claims for damages which should be honestly admitted, but not in such a way as to enable an unscrupulous person to use the admission for what is morally, though not legally, blackmailing. The human machine is not so perfect that it does not occasionally fail to avoid accidents which might be avoided, and although there may be no moral culpability, yet it seems only fair that the person whose failure has caused the accident should bear the consequences, as far as is reasonable, rather than the person who is undoubtedly quite blameless. In such cases it is both honourable and prudent to settle a claim on reasonable terms, which should include on the part of the claimant an admission that there was nothing in the mishap for which liability is accepted which is discreditable to the doctor professionally. Care should also be taken that no loophole is left for subsequent claims on various pretexts which might be put forward after denial of legal liability had been rendered impracticable. When extortionate demands are persisted in they should be resisted if possible. In some cases, even when it is doubtful if there is any legal liability, but where the claim is a genuine one and the patient has in fact suffered damage, it may be advisable generously to give a "solatium" if it is accepted in a proper spirit and as a gratuitous donation, all legal claims being effectively withdrawn.

INSTITUTIONAL MEDICAL OFFICERS AND INCOME-TAX ASSESSMENT.

THE letter of the General Secretary of the Medical Defence Union, which appeared in our issue of Feb. 9th, proves the necessity of carefully scrutinising tax demands, a course recently emphasised in this column. The decision of the Special Commissioners that a medical superintendent, occupying premises by virtue of his office, is not liable to tax on the value thereof is simply an application of an established principle. In income-tax law a profit which is not cash, or capable of translation into cash, is not assessable upon the recipient, and the case of Tennant *v.* Smith (1892) is regarded as the leading decision on the point. In that case a banking company assigned to their agent as a residence a portion of their bank premises in respect of which they were assessed under Schedule "A." The agent was required to reside in the building as the servant of the bank, and for the purpose of the performance of his duties. It was then held that the value of the residence was not an emolument of office in respect of which the agent was chargeable with income-tax; and was not to be included in estimating the total amount of the agent's income for the purposes of a claim of abatement. Lord Watson said: "I do not think it comes within the category of profits, because that word, in its ordinary acceptation, appears to me to denote something acquired, and which the acquirer becomes possessed of to his advantage—in other words, money—or that which can be turned to pecuniary account." The Lord Chancellor said: "I do not deny that, if substantial things of money value were capable of being turned into money, they might for that purpose represent money's worth, and be therefore taxable . . . The thing sought to be taxed is not income unless it can be turned into money." The value of the house in such circumstances, therefore, is neither assessable on the employee nor should it be included in his return of total income. Neither is the value of board and/or lodging assessable, and it should be similarly excluded.

ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH: *Parkin Prize.*—In terms of the bequest made to the College by the late Dr. John Parkin, Fellow of the College, a prize is offered for the best essay on certain subjects connected with medicine. The subject of the essay for the present period is on the Effects of Volcanic Action in the Production of Epidemic Diseases in the Animal and in the Vegetable Creation, and in the Production of Hurricanes and Abnormal Atmospherical Vicissitudes. The prize is of the value of £100, and is open to competitors of all nations. Essays intended for competition, which must be written in the English language, to be received by the Secretary not later than Dec. 31st, 1924. Each essay must bear a motto, and be accompanied by a sealed envelope bearing the same motto outside, and the author's name inside. The successful candidate must publish his essay at his own expense, and present a printed copy of it to the College within the space of three months after the adjudication of the prize.

THE LANCET.

LONDON: SATURDAY, FEBRUARY 16, 1924.

INFLUENZA.

DEATHS from influenza in the 105 great towns increased from 236 to 367, and in London from 74 to 122, in the last week (ended Feb. 2nd) for which figures are available. The distribution of these deaths showed somewhat increased incidence upon the ages 45–65 as compared with the age-group 65 and upwards, but no increased proportion of deaths below 45—that is to say, no reversion to the 1918 epidemic type. The rate of increase slackened from 64 per cent., which was the increase in the week ending Jan. 19th over the previous week, to 54 per cent. Provisional figures for the week ending Feb. 9th suggest that although the absolute maximum of the epidemic has not yet been reached, the rate of increase appears to be slackening. The mortality in any one week, even in the most unfavourable conditions, will hardly be as severe as that of 1922. The greatest stress of mortality has so far fallen on London and certain coastal regions, particularly in the north-east. Thus, in South Shields deaths from influenza in the successive weeks have been 4, 14, and 24; in Newcastle-on-Tyne 1, 9, and 16. Clinical reports are consistent with the impressions derived from the mortality figures. Widespread epidemic influenza of a mild 3–4 day type has prevailed in Durham and Northumberland. An area including Bath, Gloucester, Weston-super-Mare, and Trowbridge has been widely affected by mild influenza, and there is some evidence of extension to the South Wales coalfield. In the north-west cases have been relatively few. There is complete concordance of opinion that severe and pneumonic complications are very rare. In Paris influenza is unusually prevalent, it is increasing in Switzerland, declining in Algeria and Mauritius. This is the position as it is seen by the medical officers of the Ministry of Health.

Every such recurrent wave of epidemic influenza raises the question of the relationship of these minor epidemics to each other, to sporadic cases, and to the great pandemics such as that of 1918–19. Up to the present the lack of any constant bacteriological findings has rendered it difficult to arrive at a conclusion as to these relationships, and almost impossible to decide whether the protean conditions—gastric, nervous, cardiac, pharyngeal, and pulmonary—grouped under the common head of "influenza" are really manifestations of the activity of the same pathogenic agent. Whether a patient suffers from a "cold in the nose" or from "influenza" is largely a matter of individual taste or temperament, and so many chronic and subacute disorders have according to the histories given by the patients started in an attack of "influenza" that a condition, real enough as an entity and vastly potent as an initiator of morbid processes, is perhaps now hardly receiving its due meed of attention as an ætiological factor. Some hope of escape from this chaos was offered by the investigations of Drs. P. K. OLITSKY and F. L. GATES, reviewed in our columns [1] a couple of years ago, and more recent work of these authors [2] holds out some prospect that in the future "influenza," from being the limbo of all undiagnosed acute conditions, may come to be an entity as sharply defined and as readily diagnosable as typhoid fever. This happy consummation, of course, depends on whether or not the work of Drs. OLITSKY and GATES is capable of being reproduced in the hands of other investigators. Time alone will show this; already some evidence apparently in support is to hand from Japan.[3] The position at the moment is that from the naso-pharyngeal washings of patients suffering from influenza in the 1918–19 pandemic the American workers were able to cultivate a minute Gram-negative anaerobic organism, growing freely on artificial media, capable of passing earthenware filters and named by them *B. pneumosintes*. By injecting this organism intra-tracheally into rabbits they were able to produce a condition not dissimilar from epidemic influenza and clinically manifesting itself by conjunctivitis, fever, and malaise; the blood showed a leucopenia. The uncomplicated condition was not fatal, recovery taking place in from three to six days. If killed during the course of the disturbance the lungs of the infected animals were found to show constant and characteristic changes, consisting of œdema, emphysema, hæmorrhage, and a slight degree of cellular infiltration. The intra-tracheal introduction of pathogenic organisms such as streptococci or Pfeiffer's bacillus while the lungs were in this condition rapidly led to the development of a fatal pneumonia of the "influenzal" type.

The occurrence of a small wave of epidemic influenza in New York some months ago offered an opportunity for ascertaining whether the *B. pneumosintes* was concerned in this in the same way as in the 1918–19 pandemic, during which it was first isolated. In the course of their previous work Drs. OLITSKY and GATES had been able to demonstrate that on injection of the organism into the blood-stream of rabbits agglutinins were developed; they further showed that similar agglutinins appeared in the blood of human beings inoculated with suspensions of the dead organism. In their recent investigations they were able to demonstrate the presence of agglutinins active against the 1918–19 strain of *B. pneumosintes* in the blood of all the patients examined. These agglutinins appeared as early as ten days from the onset of the disease, and seemed to reach a maximum by about the seventeenth day; they persisted for some months—at least five—but not indefinitely, as was shown by the fact that the blood of persons who had suffered in the 1918–19 or 1919–20 epidemic, but not since, was free from them. The agglutination titre was low; even with special buffering of the antigen it seldom went beyond 1 in 40 in injected animals and in the human cases a positive result at a dilution of 1 in 10 was taken as diagnostic. Antibodies were also demonstrable by a precipitin test. Granted that *B. pneumosintes* is confirmed as the ætiological factor in the influenzal entity—a matter concerning which Drs. OLITSKY and GATES make no dogmatic assertions—these agglutinin and precipitin reactions may prove of great value.

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[1] The Ætiology of Influenza, THE LANCET, 1922, ii., 187.

[2] Olitsky, P. K., and Gates, F. L.: Experimental Studies of the Naso-pharyngeal Secretions from Influenza Patients. XI. Antibodies in the Blood after Recovery from Epidemic Influenza. Studies from the Rockefeller Institute for Medical Research. Reprints, 1923, xlvi., 157.

[3] Abe, T., Ishikawa, T., Nishibe, M., Nakata, I., and Tenjin, S.: An Experimental Study of Filtering Property of Influenza Virus upon certain Animals. Scientific Report, Govt. Inst. Infect. Dis., Tokyo, 1922, i., 29.

CREMATION AND THE CONCEALMENT OF CRIME.

IN a lecture on the Disposal of the Dead, with Special Reference to Cremation, recently delivered before the Royal Institute of Public Health, Dr. H. T. HERRING, who is the medical referee to the Golders Green and Woking Crematoria, dealt with various objections to the practice of cremation. While this now well-established practice has not yet entirely disarmed popular antagonisms which in part are based upon genuine religious feeling and in part upon ancient prejudices, its advocates are aware that they have to reckon with one substantial objection—namely, the fact that incineration of the body obliterates all traces of crime. Against this objection it may fairly be argued that the present system of the law of death certification, which we hope soon to see amended,[1] is so lax that a murderer is but little inconvenienced in obtaining the burial of his victim under the existing facilities. In all murder cases the criminal is anxious not only to conceal his own part in the death, but also to conceal the facts of death itself. Where this is the position, questions of the relative advantages of graveyard and crematorium are immaterial. In other cases—for example, in the series of murders by arsenical poisoning in recent years—it looks as though the criminal was sufficiently deterred from taking advantage of the method of cremation by the very stringent precautions which the State enjoins and the very searching interrogatories which the adoption of that method entails.

The Cremation Act of 1902, passed nearly 20 years after Mr. Justice STEPHEN had decided that cremation was not illegal, authorised the Home Secretary (or in Scotland the Secretary for Scotland) to make regulations as to the construction and inspection of crematoria and as to the conditions in which the burning of human remains may take place. The Home Office Regulations of 1903 prohibited cremation except in a crematorium of the opening of which official notice had been given. They forbade the burning of unidentified human remains or of the body of anyone who has left a written direction to the contrary. The necessary forms and certificates to be filled up are most elaborate. Apart from the simpler procedure where a coroner gives a certificate following the verdict of a coroner's jury, the requisite action is as follows. A form of application is filled up by the executor or nearest surviving relative; if anyone else is the applicant he has to give a satisfactory explanation of the reason why the executor or next-of-kin has not applied. Two medical certificates are required, one from the doctor who attended the deceased during his last illness and can definitely certify the cause of death, the other a confirmatory certificate by a specially qualified medical practitioner. Both the application (which has to be supported by a statutory declaration) and the former of the two certificates must give a specific answer to the question whether there is any reason to suspect that death was directly or indirectly due to violence, poison, privation, or neglect. The application and the two certificates are quasi-judicially examined by a specially qualified medical referee who can refer them back for further information. The medical referee is forbidden to allow cremation unless satisfied that the fact and cause of death are satisfactorily ascertained; if it appears that death might have been due to violence, an illegal operation, privation, or neglect, he must require a post-mortem examination; if the post mortem fails to reveal the cause of death there must be an inquest. Finally the medical referee may refuse cremation without stating any reason. These Regulations of 1903 have been recalled in some detail to show their reassuring character. In 1920 they were revised and re-issued, but only three modifications were found necessary. One of these alterations empowered the Home Secretary to relax the procedure in certain cases of death outside England and on certain conditions. Another allowed the Home Secretary to dispense with an inquest in certain cases. A third exacted more information from the medical attendant of the deceased. In addition to stating the primary and secondary causes of death as formerly, he is now obliged to say whether any other cause, and if so what, contributed to or accelerated death; his certificate also now includes a declaration in the widest terms that there is no circumstance of any sort known to him which makes cremation undesirable.

If anyone, reading the Home Office Regulations and the wording of the forms and certificates, thinks them insufficient for the purpose, he will still find it hard to imagine how they could be made more comprehensive. The burden of investigation is properly laid upon the medical profession; it has not been suggested that there has been failure to discharge the responsibility. The ingenuity of criminals and the fallibility of human beings make it impossible to claim that the machinery eliminates all risk that cremation will allow crime to go undetected. But, short of repealing the Cremation Act and making cremation entirely illegal, it is difficult to devise safeguards more satisfactory than those which at present exist.

[1] See the summary of the proposed Bill in THE LANCET of Jan. 12th p. 92.

PHYSIOLOGICAL EFFECTS OF RADIUM AND X RAYS.

THE scanty literature of this subject has been enriched lately in a paper by Dr. J. C. MOTTRAM and Dr. W. CRAMER in the *Quarterly Journal of Experimental Physiology* (Vol. XIII., Nos. 3 and 4), and by a series of articles in Vol. VII. of the Collected Reprints from the George Williams Hooper Foundation for Medical Research, by Mr. S. L. WARREN, Dr. G. K. WHIPPLE, and Dr. I. MCQUARRIE of California University. The first paper deals with the effects of exposing rats to the beta and gamma rays of radium, the special points under investigation being the effect upon metabolism and tumour growth and some special action upon the testis and pituitary. When rats were given comparatively small doses of radiation, repeated over 40 days, they became fatter and grew inoculated sarcoma less than controls; this is confirmatory of the general findings of RUSS, CHAMBERS, and SCOTT in the case of rats and of SUGUIRA and FAILLA in the case of mice, but the present authors observed the very significant facts that in the irradiated rats there was atrophy of the seminiferous tubules with increase of the interstitial cells, as well as abnormal appearances in the pituitary gland. On irradiating the testis only, the rest of the animal being protected, atrophy of the testis occurred, yet the weight of the animal increased, this increase being attributed by the authors to the formation of fat. On giving a relatively large dose of radiation to the head of the animal only, no variation from the normal was found, and the conclusion seems justified that the pituitary changes previously observed were secondary. A large part of the paper is devoted to the histological appearances of the various organs in question under various experimental conditions. A significant finding was that atrophy of the testis brought about by irradiation is accompanied with hypertrophy of the interstitial tissue. Dr. MOTTRAM and Dr. CRAMER endeavour to correlate the inter-

relationship between testis and pituitary; in particular they refer to the conclusion of other writers that the change in the anterior lobe of the pituitary following castration is due to the withdrawal of an internal secretion attributed to the interstitial cells of the testis. They point out that this cannot be the case as the effect in question sets in after irradiation, when the interstitial cells are present or even increased. They conclude therefore that the pituitary change must be due to absence of seminal epithelium. Their observations show that the two component tissues of the testis, the spermatogenic and the interstitial, have distinct and independent effects upon the organism, that of the interstitial cells being the more profound. Even in the absence of spermatogenic tissue they provide an internal secretion which produces changes in the intermediate and nervous portions of the pituitary. Possibly other endocrine organs are affected also and contribute to the metabolic changes noted. In an appendix Dr. CRAMER describes cells in the pituitary of the rat which do not appear to have been noticed before; he calls them lipo-neurocytes. The authors have not found them in the cat, dog, rabbit or guinea-pig.

The American studies are on X ray intoxication and have a practical bearing upon the treatment by means of penetrating rays, especially where irradiation involves exposure of the abdomen. Similar doses of X rays over thorax and over abdomen produce very different effects in dogs. A dose which, directed over the thorax, gives no clinical evidence of intoxication ensures the death of the animal on the fourth day if given over the abdomen. Histological examination showed that the epithelium of the small intestine from the pylorus to the ileo-cæcal valve is highly sensitive to X rays. The authors attribute the intoxicating effects which follow deep irradiation to necrosis of this epithelium. The second article compares the rates of autolysis in many of the tissues of the dog under normal conditions and after doses of radiation. In general an increased rate of autolysis was found in irradiated organs, a point of special interest being that in dogs the secretory crypt of epithelium of the small intestine autolyses first and the epithelium of the villi last, the reverse being true under normal conditions. Finally a study of renal function after X ray exposures is of a reassuring character, for the authors find that the epithelium of the kidney is much more resistant to X rays than is the epithelium of the small intestine. "Our experiments give no support," the authors categorically state, "to the current belief that an X ray nephritis may be produced by direct or indirect action of the hard Rontgen rays." Large doses were given directly over the kidney, and although a slight lowering of renal function lasting a few days was noticed, no histological changes could be discovered in the kidney itself.

THE PROTECTION OF YOUTH.

THE first Bill[1] of the new Government has been ordered by the House of Commons to be printed, and has for its general object the consolidation, extension, and amendment of the Children Acts 1908 to 1921; it is presented by Mr. C. G. AMMON, Parliamentary Secretary to the Admiralty. The Bill contains enactments relating to offences against the person where the age of the subject is under 16, makes provision among other things to extend and amend the law of homicide in connexion with child-birth, and goes with particularity into the subject of infant life protection. Many new offences are created by the proposed enactments, but one of the final clauses provides that notwithstanding anything in the measure, no persons of or over the age of 16 years and under the age of 19 years shall be liable to be kept in penal servitude: the greater rigours are kept rightly for the older offenders. The first part of the Bill, which is to have force also in Scotland, extends the law of homicide to the protection of every child partly issued from the womb of its mother, while the criminal causation of the death of an unborn child will amount to felony punishable with penal servitude, or by imprisonment with or without hard labour. Enactments in the Criminal Law Amendment Acts of 1885 and 1922, with respect to sexual offences against young girls, are re-enacted with amendments and fresh provisions, while boys under 16 are also protected from the lascivious actions of women and girls over the age of 18 years. The purpose of these provisions is obvious and admirable, but medical men will see that, where their evidence is required, it may often be difficult to speak with certainty, while it is undoubted that the public will undergo added risks of blackmail, a crime now dangerously prevalent. For these reasons certain of the proposals will undergo criticism when the measure is debated in Parliament, but the evils against which the law is being directed are of so gross a nature, and have for so long been demanding abolition, that we hope to see the remedies proposed arrive in substance, even if with modification.

The number of children who will require care and maintenance, when separated from parents or guardians who have shown themselves unworthy, will be increased by the new legislation, and the second part of the Bill, in detailing the measures to be taken for infant life protection, places great responsibility upon the Minister of Health. All persons undertaking, in return for payment or reward, direct or indirect, the care and maintenance of orphans or infants who have been separated from their parents, have to make their position good to the local authority, that is to the county or borough council, and their selection will have to be justified to the Minister of Health. To be certain that adequate shelter and succour will be afforded to the children the local authority must appoint persons of either sex to be infant protection visitors, with the duties of keeping watch from time to time over the infant charges and the premises on which they are kept; while philanthropic societies, performing similar duties in respect of the infants, will be obliged to furnish reports of their procedure to the local authority. Great liberty of action is given to the local authority with regard to appointing these visitors, either as individuals or as a committee, and there is no reason to suppose that every care will not be taken; but it is obvious that the necessity for medical advice, both in choosing the visitors and defining their activities, will often be valuable. No visitor will be useful who is not kind, but it is necessary that the visitors should also be wise and tactful, for it is proposed to give them considerable discretion in discharging their duties. It will be necessary for the local medical practitioners to be familiar with the visiting machinery. In the routine of their professional duties they will be in charge of any case of sickness that may arise; by communication with the medical officers of the local authorities they can get into touch both with those who are responsible for the selection of the visitors, and with the Minister of Health to whom this selection has to be justified. For these reasons the appointment of a visiting committee rather than the selection of individual visitors appears to us quite important: for in a committee some can supply the tact and some the discretion, while all, it may be hoped, will furnish the kindness. The proceedings of such a committee could be made known in a regular way to the medical men of the district, when help could be obtained in many directions, the medical officers of health coöperating with the practitioners to supply it. We are taking it for granted that, either individually or through such committees, full use will be made of much excellent service now proceeding directly or indirectly along the indicated lines.

[1] Children, Young Persons, &c., Bill, 1924. H.M. Stationery Office. 6*d*.

Annotations.

"Ne quid nimis."

THE PRICE OF INSULIN.

THE story of insulin has made one of the brightest chapters in modern therapeutics, clouded only by the fact that it has not been possible to distribute the boon which medicine has provided equitably as between the rich and the poor. At first the limitation of the available supply made it impossible for any but a well-to-do diabetic subject to use the remedy for "a carbohydrate jag" (the phrase has been used in scientific circles), and the lesson has since been taught that even the most lavish use of the preparation cannot dispense with the restriction of diet and the temperate habit of life which must be observed by all diabetic subjects. After a period of general disappointment, during which people of moderate means were unable to obtain the remedy in the necessary quantities for themselves or their dependents, there have followed the happier events of far larger production, lowered prices, and in certain circumstances gratuitous supply. The Province of Ontario, for example, is providing its diabetics with free insulin on the certificate of their medical advisers.

We print this week a preliminary communication from the Bio-Chemistry Department of the Middlesex Hospital, which opens the possiblity for a *substantial* reduction in the price of insulin. This will occur if the process of manufacture can be quickened, and if alcohol can be dispensed with in the preparation of the remedy. The change may then be dramatic, and to medical men it will be a pleasing reflection, if the work proves successful, that it has been carried out at a scientific department of one of our voluntary hospitals, with the collaboration of the Medical Research Council, and has been placed immediately and without reserve at the disposal of the community. It is one more example, if example were needed, of the essential soundness of the voluntary hospital principle, for the voluntary hospital is here seen to be coming to the aid of that class which lies between the persons who are fit objects of medical charity and those to whom the price which they pay for medical service is of little matter.

"SOME ENCOURAGEMENTS IN THE SURGERY OF MALIGNANT DISEASE."

ALL surgeons of experience have had occasional unexpected successes in the surgery of malignant disease but these have been overshadowed, perhaps too much, by the number of failures; for failures so often occur in those very cases in which the prognosis has appeared most hopeful. It was, therefore, a happy thought of Mr. G. Grey Turner to give an address last week to the Section of Surgery of the Royal Society of Medicine on the subject of encouragement. In this address Mr. Turner described a large number of cases of proven malignant disease operated upon with such success that they were alive and well five, ten, or more years later, or died after a considerable interval of apparently perfect health from some other malady. While many of these cases were examples of carcinoma of the colon, a form of comparatively low malignancy, where the anatomical conditions often lend themselves to an "ideal cancer operation," there were examples of success in other and more malignant tumours and even after metastasis had occurred. In the discussion that followed, other surgeons were able to recall some very striking cures of malignant disease by surgery, perhaps the most arresting being that told by Mr. James Berry of a case of periosteal sarcoma of the bones of the forearm, alive and well 33 years after amputation through the arm by Sir T. Smith. Mr. J. E. Adams knew of a case of sarcoma of the intestine first operated upon in 1912; further operation two years later revealed extensive secondary dissemination in the peritoneum, yet the patient was now alive and well, had married, and was at present an expectant mother. The question of "spontaneous cure" was raised by Mr. H. W. Carson in whose practice such an event had occurred. From Mr. Turner's address and the discussion two facts emerge. First, that a bold surgeon may by heroic measures occasionally save an apparently hopeless case of malignant disease; and secondly, that local recurrence or even metastasis after a primary operation is not an absolute bar to the successful issue of a further operation. While the statistics of the surgery of malignant disease remain as depressing as they are, these two facts should be kept in view before a hopeless prognosis is delivered.

THE ULTIMATE RESULTS OF TREATMENT BY ARTIFICIAL PNEUMOTHORAX.

BURIED in a gigantic work,[1] to which many authors have contributed, is an article by Prof. U. Carpi on the ultimate results of treatment by artificial pneumothorax. His paper is opportune, for the critics of this treatment have lately shifted their ground, admitting that the immediate results may be excellent, but arguing that it is only palliative and incapable of achieving permanent arrest of the disease. In addition to reviewing his own results after a fairly long observation period, Prof. Carpi has collected the statistics of Dumarest and Murard, L. v. Muralt, Saugman, Tiderström and Esther Carling. Prof. Carpi's own cases number 129, of which 120 were cases of pulmonary tuberculosis. In 28 cases pleural adhesions prevented the collapse of the affected lung, and within a year 20 of these 28 cases had terminated fatally. These 28 cases he uses as controls—the standard by which he judges the efficacy of artificial pneumothorax treatment in the 92 patients in whom a pneumothorax could be induced. Only 38 of these patients died during the first year of observation. In 33 cases definite recovery was effected, and in 20 complete restoration of fitness for work could be claimed. In other words, more than 21 per cent. of the patients thus treated were enabled to take up their work as before, whereas only three of the 28 controls could do so. In many cases the recovery effected by an artificial pneumothorax had been maintained for seven to ten years, and it was evident that this recovery was anatomical as well as clinical—i.e., that the condition of the lungs was like that found post mortem in cases of healing of tuberculous lesions by fibrosis. Prof. Carpi reproduces numerous illustrations showing the changes which the collapsed lung undergoes, but in the end he admits that the mode of action of a pneumothorax is not that simple process which some would have us believe. The fact that laryngeal disease and even renal disease may clear up after a pneumothorax has been induced suggests that the process is not a strictly local one, but one with far-reaching changes in the specific defensive mechanism of the body as a whole.

NATIONAL HEALTH COMMITTEES.

IN a refreshing address[2] to the London Centre of the National Association of Trade Union Approved Societies, Mr. C. A. Clark, clerk to the West Ham Insurance Committee, spoke of the long-forgotten function of national insurance committees in the sphere of public health. It was laid down in the original 1911 Act that, in addition to their other powers and duties, insurance committees should make such reports on the health of insured persons within the area as the Insurance Commissioners might prescribe. Few insurance committees have taken up the production and publication of health reports, partly owing

[1] Handbuch der gesamten Tuberkulose-therapie. Edited by Prof. Ernst Loewenstein. Vol. II. Vienna: Urban and Schwarzenberg. 1923. Pp. 1045–2025. Swiss Fr.33.75.

[2] National Insurance Gazette, Jan. 12th, 1924, p. 20.

to the absence of trustworthy ready-to-hand data and partly from fear of trenching on the ground of the public health authority. But Mr. Clark points out with justice that these committees have already much material at hand relating to health causes and effects, some of which might throw light on housing and other health problems, and he exhorts the committees to take their share in the strenuous and continuous effort which will be necessary if present housing conditions are to be ameliorated. He would like the committees to disseminate information on the few simple health rules of real value to the community. Here again the statutory obligation of insurance committees to "make provision for the giving of lectures and the publication of information on questions relating to health" has been almost completely overlooked. Expenditure by these committees upon lectures has been restricted since 1918 on account of the diversion of the general purposes fund, but interest on bank balances is still available for this laudable purpose. Mr. Clark would concentrate on the health instruction of elementary school-children, and on enlightening parents in regard to the preventable miseries of their own past school life. Generally speaking, he would promulgate health in the following forms: (1) lantern lectures at schools; (2) at cinemas, theatres, or halls; (3) unillustrated lectures at schools; (4) competitive essays by scholars in connexion with either of the above; (5) the health game or crusade in schools; (6) distribution of literature and competitive essays thereon. At a time when the efficiency of all branches of the insurance medical service is being closely scrutinised, it would not be amiss for the insurance committees, which were once actually known as national *health* committees, to see whether some onus does not rest upon them in publishing the elements of health in accordance with the information which is in their hands, and to some extent in their hands alone.

ACUTE SYPHILITIC TRANSVERSE MYELITIS.

Dr. H. N. Cole,[1] of the Department of Dermatology and Syphilology of the Medical Department of the Western Reserve University, and of the Cleveland City Hospital, who reports two illustrative cases, remarks that acute syphilitic transverse myelitis is actually not very uncommon. Of 1085 cases of syphilitic disease of the nervous system, mainly among Fournier's patients, Boulloche found 77 with a spinal onset. Williamson, in 1899, stated that between 1880 and 1899 118 cases of tabes occurred at the Manchester Royal Infirmary, as compared with 32 cases of spinal syphilis, six of which were examples of acute syphilitic myelitis and four of Erb's spastic type. There is a marked preponderance of males affected by the disease. Among 62 cases described by Kuh there were only six female patients. The process is most likely to occur in the active period of life, so that most of the patients were in the second or third decades of life, when acute syphilitic infection is most frequent. Cold, sexual excess, nervous disposition, alcoholism, trauma, and physical exhaustion have been regarded as of ætiological importance. The date of the syphilitic infection at which acute myelitis may appear varies considerably, ranging from two months after spirochætal invasion, as in one of Dr. Cole's patients, who still had a chancre of the lip and a papular syphilide, to 27 years after infection, as in one of Williamson's cases. The symptoms may develop suddenly within a few hours, or the process may require from several days to a week or more to develop fully. Pain in the back, of which both Dr. Cole's patients complained, and retention of urine are prodromal symptoms, as well as paræsthesiæ, girdle sensation, shooting pains, tiredness in the limbs, and muscle twitchings. Sooner or later complete paralysis of the limbs, in a few cases involving the arms, ensues. Sensation is generally affected. Bed-sores appear early and spread rapidly. There is usually an early infection of the paralysed bladder, the process travelling up to the kidney and resulting in a chronic pyelocystitis. Acute syphilitic transverse myelitis is therefore a severe process, and its termination is often fatal and rapid. Unless seen early the cord lesion causes great loss of irreplaceable tissue. One of Dr. Cole's patients died 37 days after the first pain in the back, and the necropsy showed syphilitic vascular changes and softening of the lumbo-sacral cord with accompanying pyelocystitis, while the other, in whom there were flaccid paralysis of the lower limbs, sphincter paralysis, and bed-sores, made rapid improvement under treatment with injections of arsphenamin and mercurial inunction, so that he regained complete control of his extremities.

[1] Archives of Dermatology and Syphilology, January, 1924.

HYDROGEN SULPHIDE.

USEFUL service has been rendered by C. W. Mitchell and S. J. Davenport in collating knowledge and observations with regard to the action of sulphuretted hydrogen.[1] This gas is formed when organic matter decomposes and it has been the cause of fatalities in sewers; it also occurs occasionally in mines, and is an ever-present danger in certain chemical processes. Nevertheless, as this review of the literature brings out, there is uncertainty as to the changes which occur in the body and result in poisoning. Many have worked at the subject, among others Dupuytren, Magendie, Claude Bernard, Hoppe-Seyler, Laborde, Gamgee, and Harnack. The gas, if concentrated, resembles carbon monoxide in the rapidity with which it may act; the subject appears to drop almost instantaneously. When less concentrated the symptoms of poisoning are proportionately slower in developing and the picture is nearer to that of poisoning by arseniuretted hydrogen. The smell of the gas which gives warning of its presence may explain why more cases do not occur; but a close observer, who once was suddenly overcome and dropped into an adjoining canal whence he was fortunately recovered to tell his story, declared to the writer that when in sufficient concentration to asphyxiate the gas is odourless and is only to be detected by a sweet taste. Possibly the acute cases belong to the anoxæmia series to which Haldane has paid special attention; certainly Haggard has recently suggested that inhaled hydrogen sulphide passes into solution in the blood, where it is rapidly oxidised, the oxygen being obtained from the hæmoglobin. At the same time the products of oxidation combine with the sodium in the plasma, whence may follow the later or more chronic effects of poisoning, such as mental and gastric disturbances and hepatogenic icterus. The review presented is held to establish that hydrogen sulphide is one of the most toxic of gases, comparable to hydrogen cyanide in the rapidity of its action and the concentration from which death will result. Even in concentrations of 0·005, such as may occur in industries, the gas is toxic. It is therefore an industrial poison with which we should be well acquainted.

[1] Hydrogen Sulphide Literature. C. W. Mitchell and S. J. Davenport. U.S.A. Public Health Reports, vol. xxxix., No. 1, January, 1924.

SOPHISTICATED MILK.

AT the present time there is considerable activity within the ranks of the milk trade in regard to improving the methods of production and purveying of milk, particularly as to improvements leading to a diminution in bacterial contamination. The annual report for 1922 of Dr. G. Clark Trotter, medical officer of health for Islington (which has only just reached us), shows that the danger of chemical sophistication still has to be guarded against, and demands unsleeping supervision. His report gives some interesting particulars in regard to milk adulteration and what he describes as an apparently organised attempt on the part of itinerant vendors to foist upon the poorer population sophisticated milk. This took the form of different milk vendors, one

man being at the back of the whole concern and supplying the milk in bulk to each retailer, touring the poorer streets and underselling the legitimate vendors in price, the profit being made up by the use of adulterated milk. Considerable ingenuity was displayed, and one defendant admitted in court that as a general rule all customers who asked for "a pint" or "a quart" were served with the separated, or mixed milk, while those who distinctly specified "milk" were served with the genuine article. Within a period of about four months out of 18 official samples purchased from these vendors eight out of 14 were adulterated, the other four being sold as separated milk. In addition, 36 informal samples were purchased, of which 18 proved genuine and 18 adulterated. The fines with costs in the eight cases in which proceedings were instituted amounted to £35 13*s*., or an average of £4 9*s*. 1*d*. The amounts of fat abstracted ranged from 11 to 51 per cent. below the low legal standard. With these ridiculous fines the paying nature of the trade is very obvious.

Two other groups of vendors were dealt with on the same lines, both of which sold separated and new milk. Discussing one group, Dr. Trotter remarks that they distinguished with great nicety between the customers who asked for "milk" and those who did not specify, the former got the "new" and the latter "separated." In the interest of the child of these poorer districts this kind of fraud should be prevented, and protection given to those who are too ignorant to protect themselves. This could be given by prohibiting the sale of milk and separated milk from the same cart. The one practice should be no more possible than for one and the same itinerant vendor to sell from the one cart or barrow sound meat for human consumption and the class of meat designated as "cat's meat." Special action was also taken against adding colouring matter to milk, and 34 out of 46 samples of milk submitted to the public analyst were found coloured with annatto. Proceedings were taken in 26 cases and fines amounting to £121 8*s*. 6*d*. were obtained, an average of £4 13*s*. 5*d*. per case. It will be noted that the fines per case for this comparatively unimportant adulteration were higher than when fat was heavily abstracted.

Dr. Trotter remarks that at the Dairy Show in the Royal Agricultural Hall in October, 1922, leaflets were distributed and free samples given of both colouring matter and preservative, recommended to be added to milk without any warning that the sale of such milk would be illegal. He adds that no legal action could be taken, for although it is illegal to sell milk with colouring matter or preservative, it is not illegal to sell or recommend the colouring matter or preservative for addition to milk.

FUNCTIONAL TESTS IN RENAL TUBERCULOSIS.

IN the Lennander lecture on renal tuberculosis, published by Prof. G. Ekehorn in *Tubercle* for May, June, and July, 1923, it was stated that "functional tests in ordinary cases of renal tuberculosis are superfluous and therefore of no value." Diametrically opposite views are expressed by Prof. H. Wildbolz, of Bern, in a paper read before the Schweizerische Gesellschaft für Chirurgie.[1] Before he ventures on the diagnosis of renal tuberculosis, he insists on the presence of three signs—tubercle bacilli in the urine, pyuria, and functional deficiency of the kidneys. When this last sign is absent, and the rate of excretion of indigo is normal on both sides, tubercle bacilli and pus in the urine should not, in his opinion, be regarded as proof positive of renal tuberculosis, even if the tubercle bacilli are obtained from a ureter by catheterisation. He has come to the conclusion that functional deficiency of the kidneys is one of the earliest signs of renal tuberculosis, and he comments with surprise on the fact that a small tuberculous focus in a kidney, most of which is histologically healthy, should be able to impair its physiological activities. One of his many arguments in favour of the functional test before proceeding to nephrectomy is that the surgeon, who is unfortified by the findings of this test, may blunder seriously during the operation. For when he has exposed the kidney, it may strike him as looking so perfectly healthy that he has qualms about removing it. He may therefore leave it in place, or commit an even greater blunder—incise the kidney in search of tubercle. Even if he fails to find it, he may have started a fatal miliary tuberculosis by his act. If, on the other hand, the functional capacity of each kidney has been determined separately beforehand, and the kidney selected for nephrectomy has proved to be functionally defective as well as harbouring tubercle bacilli, the surgeon may proceed with equanimity to remove it in its entirety, be the evidence of inspection and palpation at the time of operation never so doubtful. In the course of about 500 nephrectomies for renal tuberculosis, Prof. Wildbolz has not once been misled by the evidence of the functional test, and he has to record only one case of uræmia following nephrectomy. This case occurred about 17 years ago, when his faith in the indigo test was not as confident as it has since become. The test showed delayed excretion of indigo on both sides. This warning was neglected, and the patient died a week after the operation. Post mortem, complete cavernous destruction of the remaining kidney was found. Prof. Wildbolz has little good to say of pyelography, pneumoradiography, and several other tests, the chief charm of which would seem to lie in their novelty.

[1] Schweiz. med. Woch., Jan. 10th, 1924.

EYESIGHT AND AEROPLANE-LANDING.

THE great majority of crashes to aeroplanes occur while landing the machines, and the importance not only of perfect visual acuity, but of good visual judgment in relation to this action has been proved by Comdr. E. C. Clements, R.A.F.M.S., who states [1] that the instructors in our Air Force are sufficiently impressed with the results as to apply at once for an opinion when a pupil shows signs of inability to land. The importance of frequent thorough examination of the eyes of airmen who crash is well brought out in the account of a case given by Major H. C. Neblett, of the Medical Corps, U.S. Army.[2] The patient had been for three years a pilot in the air service, and had no trouble in his eyes up to September, 1919, when he was making a flight at 8000 feet and fell into a series of "tail-spins" to within 1500 feet of the ground. He felt a severe pain in the right side of the head and the right eye, had photophobia and blurring of vision in both eyes, so severe that he could not attempt to land for about a quarter of an hour. The left eye soon became normal, but the right eye suffered for about ten days, and thereafter was very easily tired either by reading or flying. Pain returned six months later, and from time to time subsequently he became, from this cause, unfit for duty. In July, 1921, he crashed, without history of any definitely localised injury, but was for a time unfit to fly, his eyes giving trouble. There were an unusual number of crashes and poor landings in his history. Major Neblett observed him making poor practice landings on Nov. 20th, 1921, when he ultimately broke up his plane, though he was not himself hurt. His eyes were then carefully examined; the visual acuity of the right eye was found much diminished, with lessening of the supra-orbital and temporal field, and an almost complete detachment of the retina from below was found by the ophthalmoscope. Treatment for three months had no beneficial effect and he was retired "on account of practically total blindness in the affected eye." The history of this case shows the importance of carefully examining the eyes of all pilots who find a difficulty in landing.

[1] B.M.A., Section of Ophthalmology, THE LANCET, 1923, ii., 517.

[2] Military Surgeon, December, 1923, p. 605.

CARCINOMA OF BARTHOLIN'S GLAND.

AT a recent meeting of the American Gynecological Society, Dr. Frederick H. Falls,[1] who reported an illustrative case, stated that primary carcinoma of Bartholin's gland was a very rare tumour of which not more than 20 examples had been recorded. The average age of the patients was 52·7 years, the youngest being 29 and the oldest 91. The tumours usually develop after the menopause, which has been regarded as a possible cause. Owing to its peculiar structure two types of carcinoma may develop in the gland—viz.: (1) A squamous-celled tumour from ducts near the surface in uninflamed glands or in deeper parts of the ducts in glands which have been the seat of chronic inflammation leading to alterations in their lining membranes; and (2) columnar-celled carcinoma or adeno-carcinoma arising from the gland acini or from the unaltered duct epithelium in their deeper portions. Metastases frequently occur in the inguinal glands on the same or opposite side. Recurrence is extremely common, as in all carcinomata of the vulva. Sinus formation is common and may be present for years before evidence of malignancy is seen. No instance of bilateral carcinoma of Bartholin's gland has been reported, but in Sitzenfrey's case there was a chronic inflammation of the gland on one side associated with carcinoma of the opposite gland. The symptoms are swelling of the labium in the region of the gland with œdema of the remnants of the hymen. The swelling in many cases is painless at first, but in a few months tenderness and an aching sensation develop. Sometimes there is severe lancinating pain radiating to the coccyx and groin, which is aggravated by walking and coitus, and is usually worse during menstruation. On local examination a hard lump, ranging in size from a hickory nut to an orange, is found. It is freely movable in the early stage, but later becomes fixed to the surrounding structures. The skin over the tumour may be thin and bluish and tends to ulcerate. The course is usually rapidly fatal, but cases have been recorded in which there was no recurrence after three years (Eden) or even six years (Trotta). The diagnosis as a rule is easy. The chief diagnostic points are the age, which is usually over 50, the hardness of the tumour, and its tendency to fixation. Pain, especially if associated with œdema of the vulva and skin over the gland, is very suggestive. Metastases to the regional lymphatic glands, which become hard and shotty, and a tendency of the tumour to break down are important signs. In doubtful cases the diagnosis can be established by biopsy. Treatment consists in removal of the tumour as soon as the diagnosis is made, and the subsequent application of radium and X rays to the affected areas and also to the opposite site and inguinal regions. In Dr. Falls's case, which occurred in a woman aged 38, the tumour was found to be adherent to the levator ani in its lower pole and to extend to the ramus of the pubis laterally. The carcinoma was medullary in type and probably arose from duct epithelium. Removal of the growth was followed by application of radium to the wound and corresponding inguinal region, and later by X ray treatment. At the time of publication 14 months had elapsed since the operation without any evidence of recurrence of the growth.

[1] American Journal of Obstetrics and Gynecology, December, 1923.

ENTERIC FEVERS AND SCAVENGING.

Prof. Harold Kerr, medical officer of health for Newcastle-upon-Tyne, in a paper read before the Epidemiological Section of the Royal Society of Medicine on Jan. 25th, considered the factors influencing the prevalence of enteric fever and diarrhœa. Some 30 years ago a sanitary congress was opened with the remark: "The north countryman dearly loves a privy-midden." It was a surprise to many of Dr. Kerr's audience to learn how many of these evidences of misplaced affection still remain in important great towns of the north. Apparently neither a regard for the amenities of life nor for sanitary improvement has been able to counterbalance the cost, whether to ratepayer or property owner, of abolishing these urban inconveniences. Dr. Kerr set out from the standpoint that formerly the incidence of enteric fever and diarrhœa in a district was a fair indication of the efficiency of its methods for the disposal of excreta and refuse. In the last decade of the nineteenth century many reports by medical officers of the Local Government Board and medical officers of health supported this view. It was shown that privy-midden towns grouped suffered more than water-closet towns grouped from diarrhœa and enteric fever and that the incidence of these diseases was greater on houses supplied by conservancy closets. Dr. Kerr's investigations seem to show that with a lessened prevalence of these diseases it is not so easy to make clear deductions now. The decline of enteric fever has always been somewhat of a mystery and has undeniably preceded in many towns the conversion of the middens. In some cases of badly infected towns the immunising of the more susceptible members of the population, whilst sanitary measures have been put in hand, must have had an appreciable effect. For example, in Sunderland, with a population of over 150,000, more than 5000 cases of enteric fever were notified in the 15 years succeeding the introduction of the notification of infectious diseases. In 1911 Dr. Kerr obtained figures from 41 great towns which he examined for correlation between conservancy methods and prevalence of bowel infections, but he came to the conclusion that other circumstances, such as constitution of population, occupations, habits, wealth, climate, situation and natural amenities, water-supply, drainage, and hospital accommodation, differed so much that it was only fair to compare each town with itself. He found, however, that the conversion to the water-carriage system was invariably accompanied by a decline in enteric fever, though the rate of decline has varied greatly in different towns. The Local Government Board (1910) Report on Enteric Fever in the County of Durham emphasised the primary importance of conservancy methods in maintaining high enteric and diarrhœa rates, but Dr. T. E. Hill, the county medical officer, has since pointed out that efficiency of scavenging is probably quite as important. The inconsistency of the results prompted Dr. Kerr to continue his inquiry in 1921 and to extend it to other factors such as scavenging and the distribution of dried milk. All districts showed a great improvement in the period 1918–22 over 1906–10, and this is specially noticeable when the hot year 1921 is compared with the hot years 1906 and 1908. But there are inconsistencies in the table. Among towns with a high proportion of conservancy closets Hull, Middlesbrough, Wigan, Warrington, and Darlington had high rates for enteric and diarrhœa in both periods; while in Bolton, Derby, Huddersfield, Halifax, and Rochdale the enteric rate is high and diarrhœa low; and in Gateshead, South Shields, St. Helens, and Wolverhampton the enteric rate is low and diarrhœa high. Newcastle, with 8¼ per cent. of privies, has slightly more enteric and slightly less diarrhœa than Gateshead with 76 per cent. of privies. Reports on scavenging show high standards on paper which Dr. Kerr thinks are too good to be true. Privy conversion, he concludes, played a notable, if not a chief part in the past, in reduction of enteric and diarrhœa incidence. It is not nearly so clear that conversion to-day is essential to a low enteric rate provided that scavenging is efficient. Modern road-making and methods of cleansing and replacement of horses by motors in general service have all played their part in diminishing disease. The substitution of dried for fresh milk would cut out another link in the chain of communication between midden and man. Popular education, however, and growing civilisation remain the chief means of combating diseases of uncleanness.

B.M.A. ANNUAL MEETING, 1924.

THE ninety-second annual meeting of the British Medical Association will be held in the latter part of July at Bradford, when Mr. J. Basil Hall, consulting surgeon to the Bradford Royal Infirmary, will succeed Mr. C. P. Childe in the presidential chair. The annual representative meeting begins on Friday, July 18 h. at 10 A.M., to be continued on the three following week days. Dr. R. Wallace Henry will again preside over this body. The scientific sections will meet from 10 A.M. to 1 P.M. on Wednesday, Thursday, and Friday, July 23rd to 25th, the afternoons of the same days to be given up as heretofore to laboratory and clinical demonstrations. The usual exhibition of surgical appliances, foods, drugs, and books will be opened on July 22nd, at 9.30 A.M. The annual dinner of the Association is fixed for the evening of Thursday, July 24th. A popular lecture entitled "The Sun Cure" will be delivered by Sir Henry Gauvain on Friday, July 25th. The honorary local general secretary of the meeting, on whom even now the burden must begin to fall, is Dr. W. N. West Watson, Victor Lodge, Manningham, Bradford.

POVERTY IN GERMANY.

OUR Berlin correspondent has referred on more than one occasion to the distressful effects of poverty on the health of the coming generation in Germany, describing unhappy conditions which, in the opinion of many on both sides of the Rhine, constitute a claim on the charity of the world. The British Appeal for Relief in Germany, a body which has made this matter its especial care, nevertheless feels that sufficient information on the actual condition of the children has not yet been obtained, either for a wise administration of large funds or to enable the Committee to press the appeal in an adequate campaign. To endeavour to form some estimate of the true state of affairs, this Committee has arranged for two doctors to go to Germany and to investigate the conditions at first hand on behalf of three organisations—namely, the Save the Children Fund, the Universities' Committee, and the Society of Friends' Council for International Service. In this capacity Dr. Helen Mackay, whose studies on rickets in Vienna have been published in these columns, and Dr. Melville Mackenzie, lately medical officer to the Friends' Russian Famine Relief Unit, for the Friends' Council in Russia, have been asked to make a strict report on the state of nutrition of the children in various districts in Germany, with special reference to those under school age and of the students.

THE IMMUNITY OF CHILDREN TO GASTRIC AND DUODENAL ULCER.

IN connexion with a case of perforated ulcer of the stomach in a girl, aged 7, Dr. Lennart Norrlin[1] draws attention to the remarkable immunity to gastric and duodenal ulcer enjoyed by children over the age of one year. As he points out, every case of perforation of the stomach or duodenum in the large Swedish towns comes to operation or necropsy, and it is thus almost impossible to overlook the accident. In two papers dealing with large statistics and published in Swedish this complication has been shown to be practically unknown in childhood, and of 518 cases of perforation collected by Dr. Norrlin from the Swedish and Finnish literature, there was only one case in which the patient was under the age of 15. This patient was a boy aged 14. But while children above the age of one year practically never suffer from ulcers of the stomach and duodenum, this disease is not rare in the newborn. Thus, Collin has found ulceration of the duodenum in 17 infants among 237 necropsies, and Bonnaire, Durante, and Ecalle have found two such cases among a total of 4000 necropsies. Among 1109 necropsies on infants under the age of one year, Schmidt found 20 cases of duodenal ulcer, the ulcers in several cases being multiple. In seven of these cases death was due to a hæmorrhage from the neighbourhood of the ulcer, and in three cases to peritonitis. In the remaining cases the cause of death was some intercurrent disease. Dr. Norrlin asks: Why should the age from the second year to puberty be so free from gastric and duodenal ulceration, whereas the newborn and adults are so prone to suffer from it? Children are notoriously reckless over what they eat, but they do not have to pay for their recklessness with gastric and duodenal ulcers. If the cause of this immunity could be discovered, light would probably be thrown on the lack of immunity shown by the newborn and adults, and Dr. Norrlin suggests that the determining factor may prove to be the behaviour of the glands of internal secretion.

[1] Acta Chir. Scand., Dec. 22nd, 1923.

Dr. Alfred Mantle, who is president of the Harrogate Medical Society, has just been awarded the prize by open competition in this and other countries for the best essay on the cause and prevention of rheumatic fever, and has decided to devote the awarded £120 to propaganda work for educating the poorer classes as to the prevention of rheumatism in childhood. A considerable percentage of heart troubles are known to be of rheumatic origin in early life, and may be prevented if proper care be taken by an early examination of the throat and mouth, and by the treatment of certain conditions which we know may lead to rheumatism and possibly infection of the heart. The poor are always ready to consider any pains about the limbs in children as "growing pains," and the importance of rest in bed at this time cannot be overestimated, but is neglected, and much can be done to remedy this by medical officers and the children's welfare societies' health inspectors educating the mothers as they have done so successfully in the tuberculosis campaign.

THE latest list of honours contains only one medical name, that of Dr. Henry Jackson, the well-known Mayor of Wandsworth, which is one of the largest of the metropolitan boroughs. Dr. Jackson, who graduated in medicine at Cambridge and at Edinburgh, taking also the degree in science at the University of London, began his scientific career as a worker in advanced chemistry, having carried out researches, singly or in coöperation, on the aldehydes, the derivatives from citric acid, and on glycogen; he is the author of many papers which have appeared in, among other places, the Proceedings of the Royal Society, and the Transactions of the British Association, the Chemical Society, and the Cambridge Philosophical Society. While at Cambridge he was a Fellow and Lecturer of Downing College, but leaving the University for London he soon became a great influence in municipal politics in the district where he went to reside. His work for the borough of Wandsworth has been strenuous and directed throughout towards the public good, so that all political parties in his constituency will approve heartily of the knighthood which has been bestowed upon him. We add our congratulations to theirs.

RENEWAL OF EXCHEQUER GRANTS.—The Ministry of Health announces the decision of the Government to remove the present restrictions on the grants for the development of the public health services—maternity and child welfare, tuberculosis, venereal diseases, welfare of the blind and port sanitation—which are directly aided by grants from the Exchequer. A circular has been issued to local authorities informing them that the Minister will be prepared, with the approval of Parliament, to make grants on the prescribed basis for such further development of these schemes as is considered advisable by the authorities and is within their existing powers, subject to the ordinary process of approval of particular proposals by the Ministry.

Modern Technique in Treatment.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

LVIII.—THE SURGICAL TREATMENT OF HÆMATEMESIS.

THE causes of hæmatemesis are numerous and with only a few does the question of surgical interference arise. Often the chief problem is to determine the cause, and care must be taken to ascertain that the blood does come from the stomach and is not swallowed and then vomited. In a large group of cases the hæmorrhage arising from the stomach wall is a symptom of some general condition and is rarely in itself a cause of danger or death. These conditions may be grouped as follows: (*a*) Acute specific fevers—e.g., small-pox, typhoid, yellow fever, and malaria; (*b*) toxic conditions—e.g., phosphorus poisoning, acute yellow atrophy of liver; (*c*) constitutional disease—e.g., hæmophilia, profound anæmia; (*d*) back-pressure upon the stomach—e.g., heart disease, cirrhosis of liver. In all these conditions the treatment will be directed mainly against the underlying disorder, or, if the hæmorrhage be severe, will be symptomatic and carried out on medical lines. Though in certain cases of anæmia a splenectomy, or in cirrhosis some operation to aid the obstructed circulation, may have to be undertaken, such steps should never be carried out during or shortly after a severe loss of blood, but should be delayed until the patient's condition has improved.

Acute Gastric Ulceration.

Recent investigations tend to show that in all cases where the loss of blood is due to an acute erosion of the gastric mucosa there are minute ulcers which lead to an aneurysmal dilatation of the small vessels with subsequent perforation and hæmorrhage, and probably in none of these cases is there a diffuse oozing of blood from the mucous membrane (gastrostaxis). The acute erosions may be seen clinically in three different forms: (*a*) As a complication of some acute septic condition; (*b*) as a cause of severe hæmorrhage with few, if any, other symptoms; (*c*) as a cause of the gastric ulcer syndrome in young women.

In Group (*a*) the hæmatemesis may occur as a complication of some septic wound or focus or may arise in a patient who is clearly suffering from a profound septicæmia. In this group the hæmatemesis must be regarded as a serious complication indicative of a widespread septicæmia. The hæmorrhage is often extremely severe, and even if not fatal in itself will add greatly to the danger of the debilitated patient. It is evident that no operation upon the stomach is likely to be curative, but every attempt must be made to combat the infection in the primary focus and to overcome the toxæmia. Oral administration of suprarenal extract, ℥ ii. in an equal quantity of water two-hourly (six doses), is one of the best methods of controlling the hæmorrhage. The patient's anxiety must be allayed by morphia, and after the bleeding has ceased, or, indeed, sometimes before, it may be wise to give a blood transfusion. In my experience horse serum has proved of little or no avail. Operation should only be undertaken at the express wish of the physician; the result will probably be very unsatisfactory, for although the hæmorrhage may be controlled it will be rarely indeed that the septic infection can be combated.

Groups (*b*) and (*c*) differ from Group (*a*) in so far as there is little or no clinical evidence of sepsis. In Group (*b*) the patient—frequently a young woman—will have one or more severe attacks of hæmatemesis unassociated with any other evidence of sepsis or of gastric ulceration. She may have been in perfect health until there is a hæmatemesis sufficiently severe to cause a profound secondary anæmia. The hæmorrhage may be repeated or the single loss of blood may be sufficient to endanger life. In Group (*c*) the symptoms are rather different in so far that the patient—also most frequently a young woman—will have presented for weeks or months pain, vomiting, and loss of appetite, symptoms characteristic of an acute gastritis with ulceration. Here again the hæmatemesis is likely to be severe, and if repeated may be fatal. In this group there has been much discussion as to the advisability of surgical treatment. The type of patient, the absence of periodicity of the symptoms, the relatively short history, the character of the pain, vomiting and loss of appetite should make certain the differential diagnosis of acute from chronic gastric ulcer, and since acute ulcers are often multiple and are associated with an acute gastritis, it is evident that the treatment of choice will be medical. The patient should be kept absolutely at rest and given no food by mouth, her anxiety should be controlled by morphia, and the bleeding diminished by the administration of ice, and if necessary by suprarenal extract. In a few cases, however, the hæmorrhage is so severe or so frequent that operative treatment has to be considered. Only where the patient is in a condition of the gravest danger and where an experienced physician is of the opinion that death will ensue if the hæmorrhage be not immediately controlled should operation be undertaken. Since there is a diffuse gastritis with multiple areas of ulceration no attempt to control a local bleeding point is likely to succeed, and since these patients are often in a condition of severe collapse, no time must be lost in making a useless search for a bleeding point. I believe that the only step which is likely to control the hæmatemesis is a posterior gastro-enterostomy, preferably combined with temporary occlusion of the pylorus, but certain surgeons are sceptical on this point and it is not easy to offer satisfactory proof. If a surgeon is convinced by his own figures that the results of such treatment are unsatisfactory he will be justified in refusing surgical interference. My own view is that a certain group of patients will be saved by such a measure, especially if it be combined with blood transfusion immediately previous to the operation. Among 17 cases, all desperately ill and going downhill, on whom I have performed this operation 11 were cured thereby.

Chronic Gastric and Duodenal Ulcer.

Severe hæmorrhage with a chronic gastric ulcer is not nearly so common an event, and presents less difficulties. If it does occur there may be a large loss of blood which spontaneously ceases, and is unlikely to recur or to be fatal, except if a very large artery is perforated, when the patient dies before treatment can be begun. Acute hæmatemesis in a patient with a definite past history of chronic ulcer is a clear confirmation of its presence and an indication for surgical treatment which, however, should not be carried out until the patient has recovered from the effects of the hæmatemesis. He should be kept at absolute rest in bed, on a modified diet or no food at all by mouth, and on medical treatment to control the hæmorrhage. When his general condition has improved operation should be strongly urged, for the probability of another hæmorrhage or a perforation must be remembered. Rarely the hæmorrhage will be so severe that an operation may hold out the only hope of controlling the bleeding vessel. With a large indurated and penetrating ulcer it is unlikely that the ligature of any vessels will control the bleeding, and safety can probably only be obtained by such radical steps as local excision or partial gastrectomy, procedures which, in a patient profoundly ill, are likely to have a high mortality. These dangers can to a large extent be overcome by a previous blood transfusion, which should be done very shortly before the operation so that there is no further loss of blood between the two steps. In this way there is a good chance not only of saving the patient's life, but of permanently curing the gastric lesion.

Duodenal Ulcer.

Severe hæmorrhage from a duodenal ulcer gives rise to a very similar problem, but here hæmorrhage is a

more dangerous symptom and is more commonly fatal, so that a larger number of cases will demand surgical interference. To-day this is, however, more commonly realised, and hence fewer cases of duodenal ulcer are allowed to progress to hæmorrhage before an operation is advocated. It cannot be too strongly urged (1) that operation should be undertaken as soon as the ulcer is diagnosed and before the onset of the hæmorrhage, and (2) that should the case have been neglected and a hæmorrhage have occurred, operation should be advocated *without* a preliminary course of medical treatment. It is in this that the chief distinction lies between the gastric and duodenal ulcers. The hæmorrhage of a gastric ulcer is likely to cease, and the patient's condition to improve if he be given strict medical attention. In the case of a duodenal ulcer such a happy outcome is not to be expected. The operative steps will also be different, except for the preliminary blood transfusion in any debilitated patients. If the anterior wall of the duodenum be embedded with a running purse-string suture the hæmorrhage can always be controlled, for even if the ulcer be situated posteriorly, so much of the anterior wall can be turned in that the duodenum is entirely obliterated and the bleeding point compressed. A posterior gastro-enterostomy is then rapidly performed so that a permanent cure of the ulcer is probable.

Gastric Neoplasms.

Whether gastric neoplasms are innocent or malignent, they do not, as a rule, call for treatment owing to the severity of the hæmorrhage. When a large vessel is eroded a fatal termination rapidly ensues, but in most cases the hæmorrhage is only one of several symptoms indicating the nature of the lesion; even if it is severe, treatment will be directed towards radical removal of the tumour rather than control of the bleeding, for if the tumour is inoperable this is almost impossible to achieve with certainty. If, therefore, secondary deposits are present and radical treatment is clearly impossible, reliance should be placed on medical measures alone.

Trauma.

External accidental trauma may occasionally give rise to a small tear of the mucosa, associated with relatively slight and transient hæmatemesis. The presence of such a symptom is, however, always suggestive of a more severe injury. A very careful watch must be kept, and if hæmorrhage be severe or there be the slightest evidence of a perforation—and this usually means early tenderness and rigidity—laparotomy should be immediately performed. In either case the torn portion will be carefully sutured, and the bleeding vessels thus controlled.

Surgical Trauma.

Most operations of gastro-enterostomy or partial gastrectomy are followed by a little loss of blood, but when this is considerable it is often difficult to decide whether the hæmorrhage is due to a rather excessive oozing or whether a larger vessel has not been properly controlled. The milder degrees of such hæmatemesis can nearly always be stopped by cutting off all fluids by the mouth, and giving morphia and suprarenal extract as directed above. Should this not control the hæmorrhage, or should the pulse continue to rise, a second operation, though a severe strain upon the patient, will be essential. I have not yet met with a case where this was required. Hæmorrhage occurring some months or years after a gastric operation is strongly suggestive of the presence of a recurrent or of a gastro-jejunal ulcer, and is an indication for further operative treatment. It is rarely severe or dangerous, but should it be so, the surgical treatment is that of hæmorrhage from a chronic gastric or duodenal ulcer.

Splenic Anæmia.

Splenic anæmia may lead to very severe losses of blood from the gastric mucosa, the local lesion taking the form of acute erosions. Since a considerable degree of anæmia precedes the hæmatemesis, the patient will often suffer much collapse. Wherever possible, therefore, an effort should be made to tide the patient over this before a splenectomy is performed. If the hæmorrhage persists, in spite of medical treatment, transfusion should be performed and the spleen then removed. Even after a successful splenectomy attention should be directed to the anæmia and the general condition, for although the majority of cases are cured by this surgical measure, examples of hæmatemesis occurring several years after the operation have been reported. In such cases the loss of blood is usually from a ruptured œsophageal vein.

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Special Articles.

A REPORT ON THE GEOGRAPHICAL DISTRIBUTION OF CANCER MORTALITY.

A PRELIMINARY report by Sir George Buchanan and Dr. Major Greenwood on the International Differences in Mortality from Cancer has appeared in recent numbers of the *Bulletin* of the Office International d'Hygiène Publique, and is the result of the questionnaire sent out in January, 1923.

The Questionnaire.

In view of the vast proportions of the subject and in order to ensure that the returns from the various countries should be comparable, the questionnaire was limited in the first instance to the following points:—

(*a*) The degree to which reliance can be placed on the accuracy of the cancer mortality statistics, having regard (1) to the regulations governing the issue of death certificates, and (2) to the proportion of deaths in which either no medical certificate as to the cause has been furnished, or in which the cause is too obscure or too vaguely described for statistical purposes.

(*b*) Whether statistics are available as to the distribution of cancer mortality according to geographical conditions and according to occupation.

(*c*) Whether information is available as to the proportion of deaths from cancer supervening in hospitals or other public institutions.

(*d*) Whether there are statistics as to post-mortem confirmation of the presence of cancer.

(*e*) How far the classification of deaths from cancer according to the particular organ of the body involved furnishes a reliable indication of the relative incidence of the various forms of fatal cancer.

(*f*) The number of years over which cancer mortality statistics can fairly be compared.

(*g*) Bibliography of cancer statistics available in each country.

(*h*) Any other relevant observations.

General Conclusions.

This preliminary inquiry will, it is obvious, clear the ground for a more detailed comparative study to be undertaken subsequently. Some of the general conclusions drawn from the reports from the different countries are as follows:—

1. There is an almost unanimous belief that mortality from cancer is on the increase, Norway alone not subscribing to this belief.

2. There is a unanimous opinion that all cancer mortality statistics are more or less affected by various sources of error arising mainly from difficulty in obtaining a medical certificate as to cause of death, difficulties in arriving at a diagnosis, and unwillingness on the part of the doctor or of the relations of the patient to admit the existence of cancer.

3. There appears to be no country, save, perhaps, Switzerland, in which any reliable statistics are available as to the proportion of deaths from cancer verified by post-mortem examination.

4. No very satisfactory statistics are available as to the proportion of deaths from cancer occurring in

hospitals or other public institutions. The most complete returns are those afforded by Switzerland, England and Wales, and Sweden.

5. From these and other causes it is difficult exactly to gauge the importance of local differences in the cancer mortality statistics, but these differences appear, at least in part, to be real differences—i.e., they are greater than can be accounted for by variations in procedure in the different countries in matters like diagnosis, registration, and certification.

6. There are striking differences in the different countries in the incidence of cancer of the breast and of the female genital organs. This is strikingly shown in the case of England, Holland, and Italy. For a considerable series of years the mortality in Italy and Holland from these two causes has been somewhere about half the corresponding mortality in England and Wales.[1]

A short abstract follows of the reports from some of the countries which replied to the questionnaire.

Denmark.

Owing to the stringency of the Danish laws relating to death certificates very few deaths occur in which the cause has not been verified by a qualified medical man, while the number of deaths from malignant disease which are included under the heading of "Deaths attributable to unknown or ill-defined causes" must almost certainly be negligible. In Denmark, therefore, the cancer mortality statistics may be looked upon as being as reliable as the present state of medical knowledge on the subject will permit.

Statistics are available for deaths from cancer in each town and rural district. An inquiry into the mortality-rate in various occupations is being conducted, and the results will be published in about a year. Certificates as to the cause of death may be looked upon as equally reliable all over the country, since practically all the doctors have received similar training, and equal facilities are available for medical attendance in every district.—Since 1921 statistics have been published giving the detailed causes of death occurring in most of the hospitals and clinics of the country.—There are no records of verification by post-mortem examination of deaths from cancer.—In most cases the localisation of the malignant disease is stated on the certificate, and save in Copenhagen all certificates not so completed are returned for the information to be added. It is, of course, not always possible to be sure which is the primary site of the disease.—No official statistics are available prior to 1876. Some of the apparent increase in cancer mortality must, no doubt, be attributed to the improvement in diagnosis which is constantly being effected. —Attention is also drawn to the probability that the apparent increase in mortality from cancer is also due to the diminution in the mortality-rate from other diseases, especially from acute epidemic diseases. A table is given correlating the falling tuberculosis death-rate with the rising cancer-rate for each decennium from 1890.

Great Britain.

Statistics from this country are probably reliable as far as the points specified under question (*a*) are concerned, although "senility" may conceal a few deaths from cancer. A greater source of error, however, lies in mistaken diagnoses, and in a certain reluctance on the part of the doctor to certify cancer as a cause of death.

The annual reports and decennial supplements issued by the Registrar-General give the statistics of deaths from cancer grouped according to sex, age, and occupation. While it is probable that not all the statistics are equally reliable, they are considered to be sufficiently accurate for purposes of comparison.—Since 1910 a register has been kept of deaths occurring (*a*) from all causes, and (*b*) from cancer, in Poor-law hospitals and other public institutions.—The information as to post-mortem verification of deaths from cancer is still incompletely furnished on death certificates, the furnishing of this information not being compulsory.—The statistics as to the relative incidence of cancer in the various parts of the body are probably comparatively complete for those cases in which the disease is accessible, the only source of error being the occasional difficulty in ascertaining which was the primary focus of disease.—The statistics for deaths from cancer are probably fairly comparable since 1897.

Italy.

The statistics of deaths from cancer are, on the whole, reliable, although probably vitiated by intrinsic sources of error.

Deaths from malignant disease show an appreciable and progressive increase for the last 30 years (during which period the annual statistics may fairly be compared), contrasting with the sharp decline in the general mortality-rate. —The mortality is greatest among females, especially over the age of 40.—The increase is found chiefly in malignant disease of the gastro-intestinal tract.—Post-mortem verification of the cause of death is only exceptionally undertaken, and bears no relation to the incidence of deaths from cancer.

The Direction Générale de la Santé Publique is investigating the question as to how far such factors as heredity, environment, occupation, and diet are concerned in the increased cancer incidence.

Norway.

The mortality statistics are accurate and reliable for the last 20 years, and in 1918—the latest year for which the figures are given—92 per cent. of all deaths were medically certified. The excellent statistics are ascribed to the facts that the people generally are well instructed on such matters, and that the population is so small as to make details of their social life easy to ascertain.

The regional distribution of cancer in Norway has been studied on several occasions, but not the occupational distribution. This matters the less that most of the people (70 per cent.) live either in the country or by the seaside, as agricultural workers and fishermen respectively, the regional divisions thus representing more or less accurately the professional divisions.—No statistics of deaths from cancer in hospitals or other institutions are available in Norway.—Post-mortem verification is rare.—Up to 1920 specification of the particular region of the body affected was only required in the case of cancer of the skin, digestive organs, breast, and uterus, but since that date the specification has been extended to include, in the case of carcinoma, 26 different localisations, and in the case of sarcoma, three. It is hoped that this information will later show any correlation that may exist between particular types of the disease and particular districts.—There does not appear to have been any appreciable increase in the number of deaths from cancer during the 25-year period over which the figures are comparable.

Holland.

The statistics, on the whole, are reliable as an index of the cancer mortality, but are probably under rather than over the mark, since over 8 per cent. of deaths are registered as due to senility, and nearly 6 per cent. to "unknown causes."

A few statistics are available as to cancer deaths grouped according to geographical regions, but they are too scanty to have more than a local value. A report was made for the years 1908–1911, showing the cancer death-rate among males grouped according to occupation, the occupations showing the highest rates being barbers, hair-dressers, distillers, and telegraphists.—Very scanty statistics are available as to deaths occurring in hospitals or other public institutions.—Very few cancer deaths are verified by post-mortem examination. Those that are so verified occur in hospitals and are precisely the cases in which there has been no doubt as to the diagnosis.—No details are given on the certificates as to the particular organ involved. Old statistics which are available show that the stomach is by far the commonest site of malignant disease, the liver and bile-ducts coming second. The study is now being brought up to date, and the results will be published later.—The statistics are comparable since 1901.—The cancer mortality in the Low Countries has appreciably increased during the last 20 years.

Sweden.

The statistics as to cancer mortality are not so complete or reliable as regards the returns from the rural districts.

There are no statistics relating to the comparative incidence of cancer according either to geographical distribution or to occupation. The incidence, however, appears to be greater in Central Sweden than in the outlying parts—a fact which cannot be accounted for by any difference in the average age of the respective inhabitants, or by a greater proportion

[1] This difference has been chosen by the Office International d'Hygiène Publique and by the League of Nations for an intensive study, which is now proceeding under the direction of a Cancer Subcommittee of the League's Health Committee.

of town dwellers in the former. The difference is tentatively ascribed to the operation of various social factors.—Statistics as to the proportion of deaths from cancer supervening in hospitals and other public institutions are available, and show that an average of 11 per cent. of all deaths occurring in these institutions are due to malignant disease.—There is no post-mortem verification of death.—The classification according to the site of the disease is apparently made in regard to public institutions only. Taking the figures for the year 1920, it was found that the commonest sites of cancer in men are: (*a*) stomach, (*b*) intestines, (*c*) lips, (*d*) skin; and in women, (*a*) stomach, (*b*) breast, (*c*) genitalia, and (*d*) intestines. Cancer of the lips is four times more frequent in the rural than in the urban districts, and is more frequent in small than in large towns. Cancer of the breast and female genital organs is more frequent in Stockholm and in the island of Gottland than in other parts of the country.—There is no definite period over which the returns are strictly comparable, but since 1880 there has been a gradual improvement in diagnosis and in the general level of culture and standard of living; an increase in the number of hospitals and a general prolongation of life; all of which factors tend to produce an apparent increase in the incidence of cancer.

Switzerland.

In spite of a few inherent and inevitable sources of error the Swiss statistics as to causes of death are looked upon as approximately correct. In only a small percentage of cases is the cause of death not specified, the same being true of mistakes in diagnosis. The exact margin of error cannot be ascertained but is almost certainly small.

No statistics are available as to the cancer mortality occurring (*a*) in the various geographical regions, or (*b*) in specific occupations, or (*c*) in public institutions, but such information could in each case easily be furnished.—Whenever an autopsy is held, this fact is entered upon the certificate, so that it would be an easy matter to obtain statistics upon the point.—It would be perfectly feasible to compile from the Swiss statistics tables showing the particular organs of the body affected, not only for the country as a whole, but also in certain specified regions. A study of the correlation between the incidence of special types of cancer in the different parts of the country might give valuable information as to the part played by race, diet, and other factors.—The statistics are fairly comparable since the year 1901.

United States of America.

A reliable indication of the cancer mortality is afforded by the system of registration.

A comparison of cancer mortality statistics from a geographical point of view would be possible, but would be misleading owing to the fact that patients are often transferred to other places in which there may be a better hospital service. The data available as to occupation are at present so scanty as to make statistics on this point also highly misleading.—No statistics are available for the country as a whole to show what proportion of deaths take place in public institutions.—In 21 States the death certificate specifies whether the cause of death has been recognised clinically, at operation, or by post-mortem examination.—As far as the Registration Area is concerned, there are sufficient data for ascertaining the relative proportion of deaths from cancer affecting the different organs of the body.—Statistics for the district of Columbia and for the ten States originally included in the Registration Area are comparable since the year 1900.

Union of South Africa.

Medical certification of causes of death is only obligatory in urban districts, and only as far as Europeans are concerned. Statistics as to the mortality from cancer cannot, therefore, be looked upon as reliable.

For the last four years the geographical grouping of mortality statistics has been adopted. No statistics are available as to the relative cancer incidence in the different industries.—There are at present no data relating to deaths occurring in public institutions.—No post-mortem confirmation of diagnosis is available.—The international classification of causes of death has been in use since 1913, as far as Europeans are concerned.—The statistics for the Union as a whole and for each province are comparable since 1913.—It has been found that among the Europeans of South Africa the cancer incidence approximates very nearly to that in the countries of Europe, while among the indigenous peoples living under primitive and natural conditions cancer is extremely rare.

CHANGING FACTORY CONDITIONS: RISING STANDARDS AND FUTURE DEVELOPMENT.

II.—THE RISING STANDARD OF SAFETY.[1]

IT might be argued that there ought to be appended to the title of this section a question mark, for the statistics are incomplete and unsatisfactory. It is not possible to get even approximately accurate figures as to the number of persons covered by the Factory Acts in different years, but, such as the figures are, they give no clear impression of a diminishing list of casualties, as the corresponding figures for industrial disease most unmistakably do. The standard of notification changes, and the numbers of non-fatal accidents must be taken with some caution, but the number of fatal accidents reported has probably been pretty correct for a good many years past; in statistics, as elsewhere, "stone dead hath no fellow." It is rather discouraging to find that there were 1385 fatal accidents in 1919 and 1404 in 1920, as against 946 fatal accidents in 1909 and 1080 in 1910; these years may be compared fairly because they were all of them years of good trade, though some allowance is to be made for the transition from war conditions to peace conditions in 1919. The figures for the war years being not of much service for comparison are excluded from consideration and the averages are taken for groups of four years, when we get the following results:—

	Average.			
	1902–05.	1906–09.	1910–13.	1919–22
Fatal accidents	1,060	1,071	1,208	1,146
All accidents	94,133	118,971	153,222	113,490

When we take into account extensions of the scope of the Factory Acts—in 1907 laundries were brought in, and also philanthropic institutions—the rising standard of notification helped by the Workmen's Compensation Act of 1906, and the great differences in numbers employed due to trade booms or trade depressions, the broad effect produced by these figures is of some but of no striking improvement. At all events the figures are sufficiently lurid, especially when we remember that they do not include those of the three most dangerous occupations—coal-mining, seafaring, and work on the railways.

In 1910 there was a Departmental Committee on Accidents which recommended among other things more specialisation on the part of the factory inspectorate and frequent conferences with the employers and workpeople concerned. A good deal has been done in both directions. There has been intensive study by particular inspectors of particular industries, and at least one inspector, Mr. L. C. McNair, has shown a remarkable gift for suggesting, and in some cases designing, safeguards. But a limit is set to specialisation by the fact that the whole staff of the inspectorate only numbers 200, that there is much routine work, and much demand for vigilance. Along the line of conference with employers and workpeople a good deal has been accomplished. The regulations for the very dangerous woodworking trade were the outcome of conference with subcommittees of various joint industrial councils concerned and also with the makers of machinery. Consultation with makers of machinery has proved to be one of the most fruitful lines of action. It is obviously better that guards should be designed simultaneously with the machines, and should be, if possible, an integral part of them, but this has not been so hitherto in the majority of cases. The countersinking of set screws in all revolving parts is an example of what might be done. There has been, as a matter of fact, a great improvement in the design of machine tools during the last 15 or 20 years. But much remains to be done. Each new process and each new material employed in industry bring with them their

[1] The first article of this series appeared in THE LANCET of Feb. 9th, 1924, p. 304.

own special risks for health and safety; thus, the use of celluloid obviously requires special safeguards against the danger of fire.

The outstanding change in the last 20 to 30 years has been the use of electricity both for lighting and as a motive power. There were 107 electrical accidents reported in 1902, of which 4 were fatal; there were 309 reported in 1922, of which 17 were fatal. In this connexion the greatest number of accidents reported in any year was in 1914, when there were 415; whilst the greatest number of fatal accidents was in 1919, when there were 28. When one considers the huge increase in the use of electricity and the risks involved, these figures seem to point to a very considerable measure of success in combating the dangers. The special electrical inspectorate of the Factory Department of the Home Office dates back to 1902, and the elaborate code of regulations came into operation in 1909. Whilst the growth in the number of accidents has fallen far short of the growth in the use of electricity, and satisfaction in that is legitimate, it is yet clear from the annual reports of the Chief Electrical Inspector that many accidents occur, and that several lives are lost every year quite unnecessarily. Contractors sometimes put in inferior material to lower costs, and for the same reason the sub-stations of public authorities supplying electricity are often unduly cramped, and are therefore more dangerous to work in. But the chief cause of accidents is the ignorance or the foolhardiness of the workers. Unskilled men are put to work among dangers which they do not understand, and skilled men deliberately and unnecessarily take risks. "In these cases," wrote the Chief Inspector in 1922, "although the persons meeting with the accidents were themselves at fault, the real blame rested with the responsible management in permitting work to be done under similar dangerous conditions as a normal practice."

The Need for and Value of Warnings and Instructions.

Ignorance, foolhardiness, lack of proper supervision, are, indeed, everywhere among the chief causes of accidents. These can be dealt with by proper measures, and a great deal is being done by that most useful body the British Industrial Safety First Association to spread instruction and enlightenment as to them. The movement is a new one over here, except in the case of one or two well-known pioneer firms, but in America it has achieved an enormous reduction of injuries. There is needed in all works a safety committee of workers meeting regularly with the managers; and there ought to be one person whose special responsibility it is to watch the interests of safety; in large works he should probably be a full-time man and an engineer. A great deal depends upon the proper instruction of newcomers, especially of boys and girls, as to risks and precautions. What is needed afterwards is a steady stream of reminders by poster or bulletin, or by discussion in the shop committee. The methods of advertisement which din into us the merits of a hair-restorer can be applied usefully to impress upon a factory operative that she must keep her hair inside her cap or she will pay a visit to the ambulance room, and may have no hair left to restore.

Some remarkable results are claimed already for Safety First propaganda, as already in use. Of one big paper mills near London it is reported that "in 1920 their employees lost 4235 days through accidents, but in 1921 this figure was reduced to 1225½ days (or over 71 per cent.), though there was only a comparatively small decrease in the total number of persons employed and the total number of hours worked. This meant that not only was there a very big decrease for the workers, their wives and families, in suffering and possibly in permanent disabilities, but also that at least an additional £1200 was paid to them in wages." Any reduction in accidents means also, of course, a reduction in the amount of compensation paid, and it lightens thus a burden which falls first upon industry and ultimately upon the general public as consumers.

The importance of educational methods and of the full coöperation of the workers is shown by the fact that of all accidents reported to the factory department about one-third only are due to machinery, and Mr. Gerald Bellhouse, the Chief Inspector of Factories, estimates that of the remaining two-thirds not more than one-third could be prevented by better safeguards alone. It is interesting to note that the Departmental Committee on Accidents in 1910 was apparently prepared to relegate a large number of accidents to the category of "unpreventable." To-day we are beginning to prevent the "unpreventable" The work of the Institute of Industrial Psychology shows how much hope there is that we may be able to eliminate a number of accidents due either to some mal-adjustment of worker to his tools or materials, or else due to states of mind. In particular scientific vocational guidance is likely to prevent in the future the placing of large numbers of boys and girls in occupations for which by physical and mental make-up they are not well suited.

Risks from Bad Lighting and Fire: The Influence of Pace.

It came out very clearly at the Departmental Committee in 1910 that bad lighting is the cause of a great many accidents. Men stumble in passages and gangways and they may easily do themselves serious harm, especially if there should be scrap metal lying about. Whilst the Home Office has no power to prescribe adequate lighting in ordinary cases, it may do so where there is danger to life or limb; it is prescribed for about half a dozen industries where the dangers are most obvious—e.g., ship-repairing. The next Factory Act is almost certain to require "adequate lighting" as a general provision, and, moreover, power will be given in all probability for the requirement by special order of definite standards of illumination, measured in foot-candle, in different industries. Later on it is possible that a minimum illumination may be prescribed for different processes.

Provision for escape in case of fire is a distinctly weak point in a great many factories. The blame for this must rest partly upon the employers and the workpeople, partly upon the local authorities who have the main responsibility for making and enforcing regulations for safety in this respect. It is the duty of the local authorities to certify new factories to be provided with reasonable means of escape, and it is their further duty to inspect from time to time both new and old factories (except those employing less than 40 persons, and even as to them the local authorities can obtain powers) and to prescribe alterations if necessary. There can be no doubt that many of the smaller bodies do their work very badly; and even in a large city factories of recent erection are sometimes found with doors opening inwards and with other dangerous conditions. Even when a works has proper emergency exits, they are not infrequently blocked up by material or lumber, or it may happen that only a few of the workers know where these exits are. The prime responsibility here must rest with the works manager. Fire-drills at irregular intervals are the best safeguards. Two industries come under regulation as dangerous trades because of special risk of fire: they are manufacture of or with celluloid, and the manufacture of felt hats where inflammable solvent is used. In each case a very important regulation is restriction of the amount of material which may be handled in a given space.

Both the fatigue of long hours and the speeding-up of modern industry have been alleged as causes of accidents. With regard to the former, it would seem to be true of women, but not true to anything like the same extent of men. On the whole its importance as a cause of accidents appears to have been overrated. It is probable that there is more reason to connect a high accident-rate with the high speed of modern industry. Dame Adelaide Anderson, formerly principal lady inspector of factories, has commented on the comparatively few accidents occurring in philanthropic institutions, where the work is often more leisurely

though the guarding may be less efficient. But in the absence of statistics it is impossible to be at all certain. The relation, if any, between speed and accident-rate deserves a great deal more attention and scientific investigation than it has yet received.

The Need for More and Better Preventive Measures against Accidents.

The next best thing to preventing accidents is to have the means at hand for treating them promptly and properly. It is only in the last few years that the importance of first-aid equipment has been realised, and especially its value in preventing all sorts of small wounds from becoming septic, a frequent cause of unnecessary suffering and loss of time. First-aid has been for years past a requirement in the regulations for half a dozen "dangerous trades," but the danger guarded against in most cases was specific poisoning or infection—e.g., by chromates used in dyeing or by anthrax spores; apart from that, first-aid equipment, although not compulsory, has been generally supplied in docks and shipyards, at least in the largest centres. Under that Act it was made a requirement in a number of welfare Orders, covering, amongst other trades, all work at blast furnaces and in foundries, in iron and copper mills, and in other metal works. The new Workmen's Compensation Act makes the provision of a first-aid box compulsory in every factory, and it must be in the charge of a responsible person. Insistence on the need for the immediate treatment of even trivial injuries is also an important part of the Safety First Association's propaganda. They issue posters for display in works, with pictures of germs as large as lobsters, much in the style of infant welfare diagrams.

The general impression derived from a study, both of such statistics as are available and also of the measures taken for the prevention of accidents, is that nothing like the progress has been made in this direction which has been made in the prevention of disease. A good deal has been done to lessen the number of machinery accidents, but by far the greater number of accidents are not directly due to machinery. The most that can be said at present is that attention is again being focused on the very high accident-rate, and that measures are being taken, both under State regulation and as the result of private initiative and propaganda, which it is to be hoped will bring about in the next few years a marked diminution in the number of accidents.

BERLIN.

(FROM OUR OWN CORRESPONDENT.)

"Mensæ Medicæ."

THE appalling need which all the brain workers in Germany are experiencing, say Profs. Bier, Bumm, Czerny, His, Goldscheider, and other well-known members of the medical profession in Germany, in an appeal which they have just published in the *Tageblatt*, is being felt in an overwhelming measure by doctors. Large numbers of people are no longer calling in medical aid on account of their inability to pay the fees. This dwindling number of their patients has brought thousands of doctors to such a dire state of need that they have been obliged to seek other ways of earning a livelihood, and the majority of them are in a pitiable condition. Some have even been driven to commit suicide. This need might be mitigated if in the already-existing, or planned, community kitchens in Berlin meals for the doctors—"mensæ medicæ"—could be established. For these meals they should pay a small sum of money, or in certain exceptionally unfortunate cases they might be given free. Dr. Eugenie Schwarzwald has placed at the disposal of the profession the kitchens which were created and are conducted by the Austrian "Friendly Help." What is now wanted is money for carrying on the work in the kitchens and for buying the ood. Appeal is made to everyone who has cause for gratitude to the medical profession to send contributions to the credit of the "Friendly Help" (Department Mensæ Medicæ) at the Bank of Mendelssohn and Co., Berlin W. 8, Jägerstrasse 51; and by this means assist in maintaining the public health.

Bayer "205" in Sleeping Sickness.

Speaking before the Berlin Medical Society, Prof. F. K. Kleine, of the Institute for Infectious Diseases, gave a report of his expedition to Rhodesia and the Belgian Congo to prove the new trypanocidal compound in cattle disease and sleeping sickness. The members of the expedition numbered four, including a bacteriologist and a veterinary surgeon. Cattle disease, as Prof. Kleine explained, is produced by *Trypanosoma rhodiense* conveyed to cattle by *Glossina morsitans*, while sleeping sickness is caused by *Trypanosoma gambiense* and conveyed by *Glossina palpalis*. Some weeks are necessary to develop the virulence of trypanosoma within the glossina. In Rhodesia experiments were made with monkeys, some of whom, however, died from snake-bites. By injections of the compound the experimenters succeeded in keeping infected cattle alive and in a good state of nutrition even when bitten by numerous glossinas. They ascertained that Bayer "205" did not prevent infection, but that by reducing the potency of the virus it greatly modified the disease, so that the animals did not lose weight. In November, 1922, the expedition set out for the Congo where sleeping sickness is endemic. Prof. Kleine explained that there were three stages in sleeping sickness. First the stage of infection, then maniacal symptoms were manifested, and lastly a comatose stage set in. By injections of Bayer "205" the blood was nearly always rendered free from trypanosomes, but sometimes in apparently healthy persons trypanosomes were found in the spinal fluid. In Rhodesia 35 patients were given a subcutaneous injection of 1 g. on the first, the tenth, and the twenty-eighth day, the maximum being five injections. In the Congo 105 patients were given intravenous injections of 1 g. on the first, the third, and the thirteenth day respectively. In two patients only was the trypanosome found in the blood after treatment, and even very grave cases could be cured. Transitory albuminuria sometimes occurred. The percentage of definite cures cannot yet be given, but apparently an infected district may be made healthy by the destruction of trypanosomes in the blood.

Sterilisation of the Unfit.

Dr. G. E. Boeters, a district medical officer of health in Saxony, writing to the *Aerztliches Vereinsblatt*, the official organ of the Aerztevereins-Bund, draws the attention of the profession to the present degeneration of the German race, and in the interests of posterity he proposes the sterilisation of habitual criminals, psychopaths, and feeble-minded people by castration. He contends that already under the present laws this operation is permitted, provided the degenerate has been placed under a guardian and that the guardian has consented to the operation. Dr. Boeters had already made provision for such operations in the State Hospital of Zwickau, Saxony, which is under the direction of the well-known Prof. Braun, President of the German Surgical Association. Hitherto the operation had been performed on men only, and consisted in a resection of the spermatic cords; in the female a resection of the Fallopian tubes would be necessary. In the interest of the improvement of the German race Dr. Boeters advocates that children of school age who are blind, deaf-mute, or imbecile should undergo a sterilising operation. The cost of the operation would be met by the State. Permission to sterilise ought also to lie in the hands of guardians as well as of parents. Defective, epileptic, or insane adolescents who have been confined in an asylum ought, in Dr. Boeters's opinion, to be operated upon before discharge, and permission to marry should be given only after an operation has been performed. This penalty should be imposed on all persons who have committed crimes against public morality and

also on females with more than two illegitimate children. Criminals submitting voluntarily to the operation might be rewarded by the shortening of the time of imprisonment. These very radical proposals have been the subject of discussion in the above journal in which Dr. Juliusberger, a well-known alienist and advocate of abstinence, stated that similar principles had already been put into practice in Switzerland. Prof. Forel, in particular, had advocated the sterilisation of criminals and imbeciles. He also wished the method extended to habitual drunkards. Another correspondent, however, points out that the legality of such operations, even with the consent of the parents or the guardian, is not yet clear and that it is, moreover, very doubtful whether such eugenic operations would have any measurable influence on the race while economic conditions remain unchanged.

SWITZERLAND.

(FROM OUR OWN CORRESPONDENT.)

Unqualified Practice.

I RECENTLY wrote of Appenzell as the only Swiss canton where no medical degree is required for medical practice. In the canton of Glarus, where up till 1920 the same freedom existed as in Appenzell, a popular movement has recently been started with the object of returning to the former practice. An amendment to this effect, however, was vetoed by the cantonal council, the minority consisting of Socialists. With this the question is not settled as it will be brought before the referendum of the electorate. Behind the movement are chiefly herbalists and hydrotherapeutists. The canton of Glarus had good reasons to restrict medical practice to qualified men. Among the unqualified practitioners doubtful elements were frequent, and in the debate in the cantonal council the case of an ex-convict was mentioned. That these quacks have a very flourishing trade, which consists chiefly in postal treatment, is shown by a newspaper advertisement in which one of them put his practice on sale. "Daily income 300 francs, professional knowledge not strictly necessary," it ran in the advertisement.

Cancer Figures.

As in other countries the cancer problem in Switzerland presents a serious aspect. Dr. A. Renaud, of Lausanne, has lately dealt with it from the statistical point of view. In the last ten years 12·8 death cases of cancer to 10,000 inhabitants were recorded per year, or 1 death of cancer to 780 inhabitants. The cancer mortality is 8·9 per cent. of the general mortality and 14·1 per cent. of the mortality of persons above 40 years of age. In Switzerland both sexes have about an equal share in this mortality with a slight preponderance of the male sex. Dr. Renaud's explanation of this fact is that with women cancer of external organs, more easily accessible for diagnostic means, is more common. In Switzerland 73 per cent. of cancer in men belongs to the gastro-intestinal tract, and 50 per cent. in women. Dr. Renaud shows that the increase is confined to cancer of deep organs; he is therefore inclined to attribute the increase to more perfect diagnosis. Sarcoma and carcinoma bear the same relation in both sexes, cancer being 16 times more frequent than sarcoma. In Switzerland the absolute number of deaths from cancer is 4700 per year, from sarcoma 300.

Epidemic Disease.

For a considerable time small-pox of a very mild character has prevailed; no fatal cases have yet been reported. The cantons with compulsory vaccination are signally free from the disease. In order to stamp out the small-pox the Federal Council has issued an emergency order. After notification of a small-pox case all persons inhabiting the same dwellings or who have been in contact with the patient must be vaccinated. If the first small-pox case in a parish is followed within 14 days by another, vaccination of the whole parish or district must be performed. The Federal Government is paying half of the cost of these measures; responsibility for carrying them through rests with the cantonal authorities. In Zurich about 600 persons have been brought before the police courts on account of refusal to submit to compulsory vaccination. The average fine was 50 francs.

Last July the beginning of a rather serious outbreak of poliomyelitis anterior acuta was recorded. In August the total number of notified cases was 41, in September 33, in October 70, in November 47, in December 20. This marked the end of the epidemic, for in the New Year so far only four cases have been brought to notice.

Public Health Services.

MENTAL HOSPITALS SERVICE.

THE annual report of the *West Riding Pauper Lunatic Asylum, Wakefield*, for 1922 contains matter of considerable general interest, which is enhanced by the frankness and decision with which the medical superintendent, Dr. Shaw Bolton, states his opinions on certain points connected with asylum administration. Wakefield Asylum, which retains the old style title in spite of the present vogue for "Mental Hospital," accommodates 2000 patients, and is staffed by six medical officers, all of whom hold a diploma in psychological medicine, a circumstance for which there is probably no exact parallel. The whole of the nursing staff undergo compulsory training for the certificate of the Medico-Psychological Association. Unfortunately, however, only a small proportion of the nurses thus trained have entered for the examination. "This result is most discouraging for the medical and lay officers who are responsible for the lectures and demonstrations, and makes the whole present method of training, examination, and certification little better than a farce. I am personally satisfied that this result is due to the fact that the monetary benefit resulting from training and certification, compared with the increasing wage paid to anyone who succeeds in remaining on the staff, is not sufficient. I recommend that the difference in pay between trained and untrained members of the staff be increased by an arrangement whereby no member of the staff who has not passed the various examinations at the proper time receives any annual increment in wage whatever. At present, after five years of mere service, the wage increment is more than double the monetary benefit gained by a serious worker who has obtained the medico-psychological certificate." This information is of particular interest at a time when the training and status of mental nurses are under consideration, and it is to be hoped that some measure may be adopted which will induce mental nurses throughout the country to seek official qualification.

A summary is given of the pathological work done during the year. More than half of the examinations carried out were Widal reactions. This is explained by the fact that every new patient and every new member of the staff are submitted to this test: agglutination is obtained in from 10 to 20 per cent. of cases, and these individuals are regarded as possible carriers and treated as such. Stanley Hall, where mentally defective children continue to be accommodated, has obtained encouraging results, a number of the children having been taught to do farm and other work. The number of new cases at the out-patient department shows a decrease, a fact which Dr. Bolton attributes in part to hostile and unwarranted criticisms of the asylums which have been made of late, "which have probably caused many cases to seek treatment elsewhere at the hands of the numerous professional and quack psychotherapeutists who are at present flooding the country."

The annual report of the *Crichton Royal Institution, Dumfries*, for 1923 records extensive structural changes, including the erection of new female staff

quarters, and a range of glasshouses in the gardens, providing a supply of fruit for the growth of which the climate of Scotland is ordinarily unsuited. The office of pathologist, which had been vacant for some time, is now filled, and a large amount of varied laboratory work is being done. The proportion of voluntary boarders among the patients is, as usual, a high one, no less than 319 voluntary patients having been under treatment during the year. It is a somewhat remarkable fact that the death-rate among voluntary boarders is actually higher (at 11 per cent.) than among the certified patients (9 per cent.). The causes of death in the case of certified patients are detailed, but in the case of voluntary boarders they are not. Not only is there no mention of the causes of death in these cases in the medical superintendent's report, but the nature of the mental illnesses from which they suffered is indicated only in vague and general terms, and information as to these patients is excluded entirely from the statistical tables. These omissions, on which comment was made in THE LANCET last year, inevitably suggest that patients are being received on a voluntary basis whose mental state might be regarded by some as demanding certification. In any case, it is surprising that no comment on the high death-rate among these patients should appear in the reports of the visiting commissioners. Where voluntary boarders are received on so large a scale as to comprise fully one-half of the acute cases under treatment at any given time, the report of the institution should surely afford information as to these patients in the same form and detail as in the case of the certified. To demand such information is not to attack the voluntary status, or to suggest restricting its application, but rather to protect it from accusations in which such deliberate and pointed silence as this is bound to result.

The report of the *Stirling District Board of Control* for 1922 shows that the number of insane requiring treatment at the Stirling Asylum is increasing. Four of the admissions were attributed to methylated spirit drinking, a habit which is said to be spreading. Two patients were admitted as voluntary boarders, the cost being defrayed by their parish councils, an arrangement of which this is the first example. An outbreak of enteric fever occurred during the year. Among 200 agglutination tests performed with the object of identifying carriers, difficulty was experienced in interpreting the results in the case of ex-Service attendants owing to the persistent effects of army inoculations.

An account in the *Irish Times* of a meeting of the Committee of the *Grangegorman Mental Hospital* (*Dublin*) shows that an alarming increase in lunacy has occurred in that part of Ireland. Accommodation has to be found immediately for 500 additional patients, and it may be necessary to take over the North Dublin Workhouse for this purpose. It also appears that the Government is demanding further economy in expenditure, which will involve reducing the diet scale. Some feeling has been aroused by a request that demobilised soldiers of the National Army should be given preference in applications for the post of attendant. A member suggested that "the same facilities should be offered to the men who fought for Ireland and were now being released from the jails." The impression produced by the article is that lunacy administration in Dublin is proceeding under great difficulties.

The Services.

ROYAL ARMY MEDICAL CORPS.

Maj. and Bt. Lt.-Col. W. F. Tyndale to be Lt.-Col.

Capt. W. E. K. Coles to be temp. Maj. whilst empld. as Dep. Asst. Dir. of Pathology.

Capt. A. J. Horne retires, receiving a gratuity.

TERRITORIAL ARMY.

Lt.-Col. J. Miller, having attained the age limit, is ret., and retains the rank of Lt.-Col. with permission to wear the prescribed uniform.

Maj. L. A. Avery, having attained the age limit, is ret., and retains the rank of Maj. with permission to wear the prescribed uniform.

Maj. (Prov.) J. E. N. Ryan is confirmed in his rank.

Capt. P. R. Bolus to be Maj.

Capt. B. L. Davis, R.A.M.C., to be Divl. Adjt. 55th (W. Lancs.) Divn., vice Capt. A. E. Richmond, R.A.M.C., vacated.

Capt. W. V. Cavill to be Capt. for service with Haileybury College Contingent, Jun. Div., O.T.C.

Capts. G. Candler and G. F. Denning, having attained the age limit, are ret., and retain the rank of Capt.

Capt. H. G. Kilner ceases to hold a commn.

Lt. E. N. Cook, R.A.R.O. (S. Wales Bord.), is attached for duty with the Portora Royal School Contingent, Jun. Div., O.T.C.

Lt. J. C. MacKay (late R.F.A., T.A.), Lt. G. W. Elkington (late Devon R.), and Lt. C. P. Oliver (late R.W. Kent R., T.A.) to be Lts.

Second Lt. A. W. Sheath (late R.A.F.) to be Second Lt. for service with Berkhamsted School Contingent, Jun. Div., O.T.C.

TERRITORIAL ARMY RESERVE.

Capt. G. R. Girdlestone, from 3rd Southern General Hospital, to be Capt.

INDIAN MEDICAL SERVICE.

The King has approved the retirement of Maj.-Gen. C. H. Bowle-Evans, C.M.G., C.B.E., K.H.P., and Maj.-Gen. Sir G. G. Giffard, K.C.I.E., C.S.I., K.H.S.

Diwan Chand Datta, Mangalore Padmanabha Pai, Muthuswami Nata Rajan, Tonse Panduranga Rao, and Ponathil Balakrishna Kurup to be temp. Lts.

Capt. Bhairon Dayal relinquishes his temp. commn.

ROYAL AIR FORCE.

The following are granted short service commissions as Flying Officers: S. G. Gilmore and T. Glynn.

Flying Officer T. A. G. Hudson is promoted to the rank of Flight Lt.

ARMY DENTAL CORPS.

The first examination of lieutenants before promotion to captain, and captains before promotion to major, in the Army Dental Corps, will be held in October.

SOCIETY OF MEDICAL OFFICERS OF HEALTH: TUBERCULOSIS GROUP.

A MEETING of the Tuberculosis Group Committee was held at 1, Upper Montague-street, London, on Jan. 18th. Dr. Neville Cox pointed out the desirability of uniformity in the arrangement of the annual reports of tuberculosis officers (T.O.) and medical superintendents of sanatoriums (M.S.) and the opportunities presented for collective research. Dr. E. Ward mentioned work that is being attempted in the West of England on the influence of marriage, pregnancy, parturition, and lactation on tuberculosis. It was decided that a subcommittee be formed to draft a scheme for standardising the headings and data of annual reports of T.O.'s and M.S.'s, also to suggest subjects for periodical collective investigation. Coöperation with the Tuberculosis Society, the Society of Medical Superintendents, and the Ministry of Health was regarded as essential. The following were appointed members of the subcommittee: Prof. Lyle Cummins, Dr. T. H. Peyton, Dr. Neville Cox, and Dr. E. Ward. Dr. Lissant Cox was also nominated. The Secretary suggested that an annual report on the work of the committee might be helpful, and Dr. Peyton advised also that a brief account of the meetings should be sent for publication to the medical journals. Payment to metropolitan T.O.'s for consultations at union infirmaries and the circulars thereon were discussed. The view was expressed that the Ministry of Health should be assured of sympathetic coöperation in the case of tuberculosis patients in Poor-law infirmaries, but that if smooth working in the future was to be secured, the conditions of service as regards responsibility, payment, &c., should be clearly defined. A resolution was passed that "The Group Committee is strongly of the opinion that probationary appointments of T.O.'s are undesirable and that the designation of tuberculosis officer should only be applied to medical men with adequate experience of tuberculosis work, such experience to be gained in or at an institution devoted to tuberculosis, and by post-graduate study." Dr. Ward reported that Dr. W. H. Dickinson, of Newcastle, had been nominated by the Society for the League of Nations Tuberculosis Scholarship. Further activities of the Group were discussed, including collective research, greater coöperation between various societies, propaganda lectures, and posters.

Correspondence.

"Audi alteram partem."

ELECTRONIC REACTIONS OF ABRAMS.

To the Editor of THE LANCET.

SIR,—The points about which Abrams's critics want satisfaction appear to be four in number, as follows: (1) accuracy of diagnosis, (2) reality of benefit derived from treatment, (3) exclusion of "suggestion" as the therapeutic factor at work, (4) reasonableness of interpretation of the phenomena. It may, at the outset of what promises to be a full consideration of "E.R.A.," be worth looking at the subject from a general point of view and deciding what must be the ultimate criterion of the work's value.

Accuracy of Electronic Diagnosis is generally held to mean correspondence of "E.R.A." findings with "clinical" (meaning also bacteriological) pictures. In other words an "E.R.A." diagnosis is judged accurate if from it the clinical picture can be correctly deduced. Accuracy in this sense, however, cannot be the chief measure of value. The value of clinical diagnosis depends essentially upon how it serves the purposes of prognosis and treatment. Similarly the value of "E.R.A." diagnosis must be gauged mainly according to these practical considerations; moreover, however interesting a general correspondence between "E.R.A." and "clinical" findings may be, it would be surprising to discover that they absolutely fitted in with one another; for they represent sets of observations on different planes. Knowledge that a patient is infected by the gonococcus does not enable us to conclude that the grosser clinical picture is that of arthritis, though it may be so. In the same way the "60" reaction of Abrams may mean a condition of the tissues often, though not invariably, associated with demonstrable streptococci. After all, why must a new conception of disease be condemned because it is not wholly intelligible from the standpoint of older conceptions? Depend upon it, a new idea will thrive or wither simply according as it proves useful or otherwise in helping the sick.

Benefit from Treatment must be judged impartially in comparison with that derived from other therapeutic measures. For this purpose, in order to satisfy everybody, "clinical" (rather than "E.R.A.") diagnoses, which are definite and have been agreed upon, must naturally form the basis of the investigation.

The *Exclusion of "Suggestion."*—There are few, if any, who will now maintain that "suggestion" can be absolutely and certainly excluded from any form of therapeutics—even if such were desirable, which it is not. Various indications, therefore, which lead us to think that "suggestion" is not the chief agent at work in Abrams's treatment, though very interesting, can never help us to reach a definite conclusion in this connexion. But there is one thing which can help us to do so—namely, a comparison of the effects on organic disease of Abrams's treatment plus "suggestion" with other forms of treatment plus "suggestion."

Interpretation of the Phenomena.—"Reasonable interpretation" of a diagnostic or therapeutic procedure has never been regarded in medicine as the sole index of that procedure's usefulness. Only those who can satisfactorily explain the working of all the measures they employ to help the sick can demand as a necessary vindication of Abrams's methods a complete explanation of the phenomena. Moreover, it is obviously easier for Abrams's critics to say there is nothing in his machines than for his students to furnish an adequate physical explanation of their action. Surely to deny facts which are at present not susceptible of a proper interpretation is to take up what history has proved over and over again to be a mistaken attitude!

General Conclusion.—There are not a great number of complex conditions, including proof of "accuracy" of diagnosis, which must be fulfilled before Abrams's methods can win for themselves a deserved recognition. There is only one condition and that is that the investigated results of his treatment turn out to be thoroughly good and compare favourably with those of other forms of therapeutics. This must be the final and ultimate test; and it is the test by which students of Abrams are quite prepared that his work shall be judged. It is noteworthy that the first reply to the criticisms of "E.R.A." lately begun in the British medical press contains an offer to have the results of treatment along one important line publicly investigated; and the spirit of this offer has but one significance—namely, that Abramsites desire only to maintain a faith based on reality.

I am, Sir, yours faithfully,

Beckenham, Jan. 26th, 1924. J. KENELM REID

To the Editor of THE LANCET.

SIR,—I have no wish to trespass on your valuable space by writing any lengthy comment on the humorous article by Dr. Howard Humphris in THE LANCET of Jan. 26th on the electronic reactions of Abrams; as he says, his information is mostly secondhand. I am, moreover, not in the least desirous of raising any defence of the E.R.A.; I am quite content to let them stand or fall, being judged by their results.

But if Dr. Humphris, or anyone else who would care to test the accuracy of the statements made in this article, cares to put to the proof the statement "with our own knowledge of electricity it would appear to be impossible for any electric current in any form to pass from the intake . . . to the patient," I shall be delighted to give him an opportunity of doing so, on the understanding that he informs you of the result, with a view to its publication in THE LANCET.

I am, Sir, yours faithfully,

JAMES B. TOMBLESON.

Crowstone-road South, Westcliff-on-Sea,
Jan. 26th, 1924.

To the Editor of THE LANCET.

SIR,—In your issue of Jan. 19th you report the demise of Dr. Albert Abrams of San Francisco. In your next issue Dr. F. Howard Humphris relates many details which the lay press have already presented to the public. Because this article on Abrams's Electronic Reactions is only further pabulum for the highly sceptical to laugh over, I scarcely observe anything in the coincidence of these two insertions which upholds the fair honour of our profession, unless it is to open up a discussion on behalf of an enthusiastic and original colleague who has not lived to exonerate himself.

When we had the amazing discovery laid before us by Prof. Rutherford regarding the electrical properties of the atom, we gaped in admiration. Because these investigations were conducted in a truly scientific manner, we did not have sensational lay press reports to depict lurid possibilities as each step was improved upon. Because Abrams lived in a country of advertisement is it not probable that the lust for the sensational had eclipsed the desire for truth? Unless Abrams had succeeded where others had failed, clinically, this natural consequence of jealousy and contempt would not be so apparent amongst his countrymen.

The conclusion that a fair and open mind can easily come to in this country is that "Abrams was the originator of a research into strange phenomena about which we know little." After a study of the various modifications of his instruments one finds that all his followers and "off-shoots" obtain precisely similar phenomena. There are other instances known where observers have noted these same phenomena from different standpoints. Precisely similar abdominal areas dull to percussion *can* be demonstrated on the

human subject when the subject is exposed to the oscillations of a wireless aerial. These areas stand out so decidedly from the surrounding resonance that here we have a phenomenon from which to set out on a criticism of the findings of our dead colleague.

Until an obvious phenomenon of this nature can be explained on a scientific basis we have no right, as sportsmen, to pick out what is immaterial from a dead enthusiast's discoveries. There is too much unscientific data in our own empiricism to justify such an attitude. It is of no ultimate value to science to have the failures of a pioneer pointed out to us. Was there anything fair in sending Abrams a specimen of a rooster's blood with the intention of deceiving him? In this profession of ours we even sign an oath against foul play! It is only an expert who can detect a spurious Bank of England note always. Our advanced position in science gives us a wide view of our ignorance. We cannot blame Abrams for not being an expert, but it is easier to deliver a judgment on the man who delivers the spurious note and hilariously publishes the nefarious result. Somehow it seems far removed from even a scientific intuition.

I am not writing primarily to praise Abrams, but to support the sentiment of the younger generation of our profession. That sentiment is so pleasantly devoid of a besodden sense of prejudice, and is so refreshingly imbued with a desire for scientific investigation into every new roadway which can ennoble our calling, that we are not happy to be left with only one side of a new investigation. Because Dr. Humphris was so fair as to say that his article was not a criticism it is disappointing to observe that he did not dwell on any case where Abrams's methods had preceded definite clinical improvement. It is investigation of this latter nature which will maintain that high standard of respect which the younger readers have for THE LANCET. Such investigation will undoubtedly stimulate interest in the subjects you consider to be worth bringing to our notice.

I am, Sir, yours faithfully,

WM. R. MCCRAE.

Montpelier Rise, London, N.W., Jan. 26th, 1924.

THE EXPLOITATION OF NURSES.

To the Editor of THE LANCET.

SIR,—It ill becomes anyone in the position of Dr. E. Cautley to level accusations and make such sweeping assertions on matters connected with the Nurses Registration Act and its administration by the General Nursing Council, as it is very obvious he is ignorant of the provisions of the Act. May I suggest he studies the Act with the rules and regulations as passed by Parliament, and I imagine he will realise most of his criticism is wide of the mark and quite uncalled for.

Dr. Cautley would make it appear that one examination is required for which a fee of 5 guineas is demanded, whereas two examinations—preliminary, after the first year's training, and a final, after three years—are included in the charge. Out of the 2 guineas charged for the preliminary examination, 1½ guineas is earmarked for payment of examiners, leaving the balance for all overhead charges, such as staff and office upkeep, printing, rent of premises hired for holding examinations all over the country, invigilators, travelling expenses of examiners, &c. The final examination will likewise be a very costly affair, and personally I do not consider the fees will meet the overhead charges. The General Nursing Council have followed the methods adopted by various examining bodies, such as the University of London, in their endeavour to carry out the provisions of the Act with regard to examinations, and when the number of centres in which examinations require to be held is considered it will be realised the examinations cannot be conducted at a lesser fee. Already I have heard of medical men questioning whether it is worth their while to act as examiners, as in their opinion the remuneration would be inadequate.

"Women paying such fees," states Dr. Cautley, "should have some voice in the matter," but surely he is aware that two-thirds of the Council is composed of nurses elected by nurses themselves, the remainder being medical men and members of the lay public, all appointed by the Privy Council, Minister of Health, &c.

I need not enter into his other arguments, but would like to assure your readers the General Nursing Council have no desire to make a profit out of examinations, but they must of necessity ensure that expenses are met, and if it is found that the examinations can be conducted cheaper than contemplated, then undoubtedly the fees would be revised accordingly.

I am, Sir, yours faithfully,

R. DONALDSON,

Chairman of Finance Committee, General Nursing Council.

Hinde-street, Manchester-square, W. 1, Feb. 9th, 1924.

To the Editor of THE LANCET.

SIR,—The letter from Dr. Edmund Cautley in your issue of Feb. 9th appears to me to state the case exceedingly well. As far back as Oct. 25th, 1923, I wrote myself to the Registrar of the General Nursing Council as follows:—

"Thanks for your reply to my letter of the 23rd instant. I am afraid that so far as we are concerned your Council's decision as to examination fees practically settles the case for us, as it will do for a good many more hospitals. Speaking personally, I do not think for a moment that there will be any enthusiasm whatever on the part of fever nurses at any rate to qualify for inclusion of their names upon the Council's register at a cost of 5 or 8 guineas in examination fees in addition to the fee for registration, since they simply cannot afford that amount of money. I am sorry indeed because I am most anxious to see the establishment of a reliable register, but I am very much afraid that its success will be gravely prejudiced by the high fee your Council has decided upon. Under the circumstances, I hardly think it is of any use our offering to coöperate in the examinations."

I am, Sir, yours faithfully,

H. KERR,

Medical Officer of Health; Medical Superintendent, City Hospital for Infectious Diseases.

Health Department, Town Hall, Newcastle-upon-Tyne, Feb. 11th, 1924.

SMALL-POX AND VACCINATION.

To the Editor of THE LANCET.

SIR,—Dr. C. K. Millard's criticism of Dr. J. C. McVail's address on the above subject is clever but not convincing. It is amusing to read in it accusations of special pleading (among other things) when the whole criticism is nothing more than a piece of special pleading for Dr. Millard's pet theory that infant vaccination is an error because modified small-pox masks the disease. For this theory he has to make two assumptions: (1) That natural small-pox is always so severe that it is immediately diagnosed. He should know perfectly well that this assumption is unwarrantable. (2) That modified small-pox is always so mild as to be missed; also an entirely unwarrantable assumption.

Dr. Millard will find it difficult to persuade us that the immunisation of a large and susceptible section of the community for even a temporary period—i.e., generally for nine to ten years, frequently for longer—has had nothing to do with the reduction in the incidence of small-pox, or that in the event of a small-pox outbreak a mass of vaccinated and revaccinated persons is other than an invaluable barrier against the spread of the disease. There are other criticisms to be made.

1. He forgets to mention that, in the Poplar epidemic, two unvaccinated children lost their lives, both preventable deaths if infant vaccination had been practised. What would happen if small-pox of a virulent type were to be introduced into an unvaccinated infant school? Would Dr. Millard be satisfied with "isolation and surveillance of contacts" then? Yet this is what occurred in pre-vaccination

days and has done since (vide the Gloucester epidemic 1895).

2. He omits to mention the special circumstances under which Germany has been placed as regards the importation of infection since 1917. Can he let us know how many of the small-pox cases since 1917 were German citizens who had been twice vaccinated? Until we get this information and some accurate report of the epidemics, then Dr. McVail's adjective of "interesting" is still the correct one, and "disconcerting" must still be applied to the case of Germany before 1917 from the anti-vaccinists' point of view. It would be instructive to see Dr. Millard dealing with the conditions which prevailed in Germany by his methods of isolation and surveillance of contacts.

3. Dr. Millard is advancing in his views, for he is now even prepared to regard the vaccination of contacts as not essential, although in an airy kind of way he talks of it as being "valuable to prevent secondary cases." I wonder in how many towns the medical officer of health can exercise any adequate surveillance of contacts in a small-pox outbreak; and this from Dr. Millard, who in the Leicester epidemic of 1903 vaccinated about 800 contacts. The "modern" methods of control of small-pox, according to Dr. Millard, are isolation and surveillance of contacts. Then I say good luck to the medical officer of health who relies on them. In other words, the good luck of Leicester and not of Gloucester. As far as the experiment of Leicester is concerned, which after all is an experiment in taking risks with child life, Dr. Millard was very adequately replied to by Dr. McVail in "Half a Century of Small-pox and Vaccination." The reply still holds good, and Dr. Millard's case remains the same—a very weak one.

4. We are not quite sure whether the American type of small-pox breeds true, but in any case few medical officers of health would view with any degree of pleasure their districts in the condition of the City of Gloucester last year, and in which other districts are placed this year. Surely all this is not due to the incompetence of medical officers of health. Dr. Millard's other criticism that Dr. McVail's remarks might mislead the Members of Parliament speaks little of Dr. Millard's opinion of the intelligence of the latter. I do not know if Dr. Millard's criticism is intended for publication as an anti-vaccination pamphlet, but one can hardly consider it as a scientific criticism of Dr. McVail's address; why not have published it in the *Vaccination Enquirer* and not THE LANCET?—I am, Sir, yours faithfully,

A. H. G. BURTON,
Medical Officer of Health, Ilford Urban District Council.

Feb. 9th, 1924.

To the Editor of THE LANCET.

SIR,—Dr. Killick Millard has made his position clear. He believes vaccination produces immunity, though he qualifies this statement by the word "temporary," whatever that may mean. Vaccination, he agrees, can prevent doctors, nurses, and contacts developing small-pox, and when successfully performed in babyhood confers some sort of "temporary" immunity, since for periods, varying from a year or two up to 50 or more, it retains its influence by either keeping the subject immune from the disease, or so modifying it that, if he should be so unfortunate as to catch small-pox, he *may* escape death and disfiguration, not know what is the matter, and give the disease to others whose parents did not believe in modern ideas of immunity at the time they were born. These being his views on the efficacy of vaccination, the question of its application to the infantile population seems to rest on other than medical grounds.

Having taken much trouble to convince us that he is at one with the medical profession in their view that vaccination can protect the individual, he next propounds the extraordinary view that it cannot protect the community, as if the latter were some quite distinct entity, and were not made up of individuals. Such an argument makes one sit up and rub one's eyes to make quite sure that one is not in some land of dreams which defy all logic. Further, Dr. Millard is practically asking the individual to sacrifice his life and personal appearance for the sake of the community. "Please do not get vaccinated, because if you get small-pox it may be so mild that you may recover unscarred, and no one can be sure that you have had the disease." I can imagine the reply of the ordinary adult to such a proposition, and if he should object, when of age, to make this sacrifice for the community, why should we place him in such a position when he is a helpless infant. Frankly, I do not understand the position. I can understand a person not believing in the protective power of vaccination, and for such a one to object to infant vaccination is quite logical. But to say that certain preventive treatment is effectual for the individual or a portion of the community, but not for the whole, is incomprehensible.

As for the modern methods, on which Dr. Millard lays so much stress—viz., prompt hospital isolation of patients, quarantine and observation of contacts—it would not do to vaccinate the latter, lest they might get mild small-pox and escape observation—and disinfection, they are neither very new nor very modern, but may better be described as old methods perfected along with our general improvement of public health administration. The most recent methods go far beyond these, and aim rather at the production of natural or artificial immunity by such methods as vaccination and inoculation, coupled with hygiene on physiological lines. The late war showed the extraordinary efficacy of such methods, and these in conjunction with the older ones of isolation and disinfection render the individual and community, to which they are applied, as nearly impregnable to infectious disease—where the infecting agent is known—as is humanly possible. In those diseases such as measles and scarlet fever, where the infecting agent is unknown, Dr. Millard himself has repeatedly called attention to the futility of those "modern methods" he lauds as so useful in small-pox.

If the nation be *not* prepared to allow themselves to become immune by nature's extremely slow, sure, and wasteful method of "natural selection," they *must* be prepared to interfere much more energetically with nature on the modern lines which science daily opens up to us, else infectious disease will never be completely under control till the ordinary "homo sapiens" dies out, and the race is superseded by a new subspecies of supermen, who through untold ages of natural selection have acquired immunity to all the ordinary infections which afflict us now.

I am, Sir, yours faithfully,

R. KING BROWN, M.D.,
Medical Officer of Health, Bermondsey.

Feb. 12th, 1924.

SYNCHYTRIUM AND CANCER.

To the Editor of THE LANCET.

SIR,—That synchytrian parasites pass through chromidial and cytic stages, which correspond with those of the alien bodies that are an inseparable feature of the common human cancers and sarcomas, was stated in an article published in THE LANCET in 1921 (vol. ii., p. 495) under the heading Protista and Disease.

During the past three months I have made a practical study of the *Synchytrium* of the common dandelion and I have found that in some cases, side by side with the well-known nucleated form, which is a conspicuous object in epiderm-cells, there is a dense chromidial form seen not only in the epidermis but also in cells of the mesophyll and even of the vascular bundles. That these dense bodies are a phase of *S. taraxaci* is proved on tracing their career by careful examination of leaves taken at different stages of the disease; they are destined to become sporangia, either in a sorus or of the resting type. In the latter

case much yellow or black pigment is formed from them. These bodies in their dense state, and also when they are expanded into sporangia, and in their new nuclei, capsules, &c. resemble the bodies I have described in various malignant and some other tumours; more especially in squamous epitheliomas.

I am informed that *S. taraxaci* is abundant in the neighbourhood of Aberystwyth from spring to October, especially during June.

I am, Sir, yours faithfully,

London, W., Feb. 2nd, 1924. J. JACKSON CLARKE.

COMMON INTESTINAL WORMS.

To the Editor of THE LANCET.

SIR,—With reference to Dr. William Nicoll's remarks in his paper on the Pathogenicity of Common Intestinal Worms in your issue of Jan. 26th, regarding the need of an up-to-date bibliography containing the more important clinical records of recent years, I may point out that reviews of recent work on the clinical aspects of intestinal parasites with bibliographies have been published by me in the following issues of *Medical Science:* Abstracts and Reviews: 1920, i., 401–4; 1921, iv., 103–9; 1922, vi., 280–7; 1923, ix., 91–6. It is noteworthy that of the 86 papers reviewed, most of which were written from the standpoint of general medicine, surgery, and neurology rather than of helminthology, only 4 had been published in this country, as compared with 26 in the United States, 26 in Germany, 15 in France, 4 in Switzerland, and the rest in other European countries, India, and Japan. Of the 26 American papers, the majority, as was to be expected, deal with hookworm disease, while the large number of articles published in Germany is to be attributed to the extraordinary increase in helminthiasis among all ages and classes of society in that country since the war owing to the prevailing lack of cleanliness and the predominance of a vegetarian diet (Müssig[1]). The recent, though less marked increase of helminthiasis in France, which has been strikingly illustrated by the fact that in the two years following the war one out of every three patients operated on in the Havre hospitals vomited an ascaris after the anæsthetic has aroused considerable interest in the subject, especially as regards the effects of the infestation on the nervous system. Several cases of meningitis have recently been recorded in France closely resembling tuberculous meningitis, not only in their clinical symptoms, but also in the character of the cerebrospinal fluid, the principal differences being the absence of tubercle bacilli and the rapid recovery after evacuation of the parasites in the meningitis caused by worms.

I am, Sir, yours faithfully,

J. D. ROLLESTON.

Grove Hospital, Tooting, S.W., Feb. 6th, 1924.

"AN INTRODUCTION TO SURGICAL UROLOGY."

To the Editor of THE LANCET.

SIR,—In a notice of my small book with this title (THE LANCET, Feb. 2nd, p. 237) your reviewer, while praising the soundness of the actual text, says that the author describes surgical urology "as a 'terra incognita to many practitioners' without justifying his criticism of his colleagues." The words I actually used were (page v.) "seems to be something of a terra incognita"; and they were based, not upon opinions formed by myself, but upon statements made to me by practitioners as to their own lack of familiarity with the subject. Thanking you for this opportunity of clearing myself from the charge of unfairly criticising any of my colleagues,

I am, Sir, yours faithfully,

Welbeck-street, W., Feb. 9th, 1924. W. K. IRWIN.

[1] Münchener medizinische Wochenschrift, 1921, lviii., 1395.

BLOOD-COMPATIBILITY OF MOTHER AND INFANT.

To the Editor of THE LANCET.

SIR,—I am in agreement with the views expressed by Dr. S. C. Dyke in his letter published in THE LANCET of Jan. 26th. When my paper appears, Dr. Dyke will see that there is little, if any, difference in our opinions.

I am, Sir, yours faithfully,

Liverpool, Feb. 4th, 1924. NORMAN B. CAPON.

Obituary.

SIR KENNEDY DALZIEL, F.R.F.P.S. GLASG.

Sir Kennedy Dalziel, surgeon to the Western Infirmary, Glasgow, died on Sunday, Feb. 10th, in his sixty-fourth year. A native of Dumfriesshire, he was born at Merkland, Penpont, in 1861. He received his early education at a private school in Dumfries and studied medicine at Edinburgh University, and qualified M.B., C.M. in 1883. He continued his medical studies in Berlin and Vienna, where he specialised in experimental surgery and pathology. On his return to Scotland he settled in Glasgow and there, little by little, won his way to the front rank among surgeons. In recognition of his prominent services in his profession, particularly during the great war, the King conferred the honour of knighthood on him in 1917. His first appointment was as house surgeon in the Royal Infirmary, and in 1885 he succeeded Sir William Macewen as casualty surgeon for the Central Division of Glasgow, a position which he retained until 1894. In 1887 he was admitted F.R.F.P.S. in Glasgow, by examination. Intimately associated with Sir William Macewen in the Royal Infirmary and with Sir Hector Cameron in the Western Infirmary, Sir Kennedy (then Dr.) Dalziel joined the staff of the Western Infirmary in 1899. He was also for a number of years senior surgeon to the Royal Hospital for Sick Children. His connexion with that institution began in 1891, and he held the appointment until the completion of the scheme for the erection of the new hospital buildings at Yorkhill, in which he took a very active part until it was brought to a successful conclusion in 1914. He was consulting surgeon to the Glasgow and South-Western Railway and to the City of Glasgow Fever Hospitals, and was medical referee under the Workmen's Compensation Act. As a teacher and demonstrator Sir Kennedy Dalziel had many natural gifts, enriched by a wide experience and applied with a sympathetic mind, which contributed in no small measure to the fame of the Glasgow Medical School. He was lecturer on medical jurisprudence and professor of surgery in Anderson's College, Glasgow, and lecturer on anatomy in the Western Medical School.

In his work as an infirmary surgeon and in his private practice, to which he devoted himself unstintedly, he won the esteem of an ever-growing circle, both through his outstanding skill as a surgeon, and through his personal charm and sympathy. His contributions to medical literature, which were considerable, dealt mainly with abdominal surgery[1] and showed the same concise grasp of his subject which characterised his lectures. He also contributed to the proceedings of a number of medical societies in Glasgow with which he was connected. For many years Sir Kennedy Dalziel was associated with the volunteer movement and later with the Territorial Medical Service, where he attained to the rank of lieut.-colonel. On the outbreak of war he was appointed to an important position in the direction of No. 3 General Hospital, Stobhill, and he also rendered valuable war service in many other directions. He was appointed a consulting surgeon to the War Office, and visited the hospitals in France.

[1] See THE LANCET, 1902, ii., 503.

As the son of a farmer, he had a natural bent towards farming and stock-breeding, which he carried out with enthusiasm on his estate of Nether Kinneddar, in Fife. This occupation, which became more than a hobby, claimed more and more of his interest in his latter years, and he was never happier than when on a round of his pastures or stalls with any expert friend.

Sir Kennedy Dalziel, whose funeral took place on Wednesday, Feb. 13th, from Glasgow Cathedral to the Necropolis, is survived by Lady Dalziel and by their family of two sons and three daughters. One of his sons is Dr. George Dalziel, surgeon, Glasgow, who served with distinction in the Royal Army Medical Corps in the war and gained the Military Cross.

WILLIAM CURTIS, M.R.C.S. ENG.

BY the death of Dr. William Curtis, at the great age of 87, on Feb. 8th, Alton, Hants, has lost one of its oldest, best known, and most respected inhabitants. He belonged to a family of medical men who had practised for several generations in the town and neighbourhood, and was known not only as a careful practitioner, but also as a naturalist and authority on geology; with the help of his brother, Dr. John Curtis, he gathered together a large number of most valuable specimens illustrating geology and other branches of natural history, which he presented to the town and which now constitute the "Curtis Museum." Born in 1836, he was educated at one of the Friends' schools, near London, and in 1855 entered St. George's Hospital as a medical student. He qualified in 1858 as M.R.C.S. and L.S.A., and returning to Alton joined his father in practice. In addition to a large private practice he held the appointment of parish doctor and also medical officer to many clubs. It was during his time that a cottage hospital was started and he took a prominent part in its promotion. He retired from practice in 1911. Apart from medical work he gave a large share of his time to affairs in the parish. For the Mechanics Institute he acted as curator of the museum after the death of his father. After extensive research amongst old documents, parish registers, and the Domesday Book, he collected a number of facts which he put together in "A History of the Town of Alton," which he supplemented later by a smaller volume on the "Surrounding Parishes."

He married, in 1874, Miss Annie Withycombe Farthing, a daughter of Mr. Henry Farthing, of Wodington, Somerset.

SOUTH LONDON HOSPITAL FOR WOMEN. — A urological department has recently been opened. Out-patients are seen at this department, 86–90, Newington-causeway, S.E., on Tuesdays, at 1 P.M.

BATH CLINICAL SOCIETY.—A meeting of this Society was held recently at the Royal United Hospital, Bath, Dr. W. P. Kennedy, the President, in the chair. Dr. R. Waterhouse read a paper on Heberden's Nodes, in which he reviewed the literature dealing with the relationship of these nodes to gout. He then described the findings in 66 cases of his own. He did not consider that there was any real connexion between Heberden's nodes and true gout. In his experience patients showing Heberden's nodes derived great benefit to their general condition from hydrotherapy. The nodes themselves were unaffected. The following cases and specimens were exhibited:—Dr. F. G. Thomson: (1) A case of syphilitic enlargement of liver and spleen which had almost cleared up on antisyphilitic remedies; (2) a case of encephalitis lethargica; and (3) one of cerebral embolus following mitral stenosis. Dr. C. A. Marsh and Mr. F. Lace: A case of old epithelioma of the right tonsil successfully removed by operation. Mr. C. Terry: (1) A case of lupus of the hard palate successfully treated by radium; (2) an X ray showing obstruction at the hepatic flexure which was found to be due to a cystocolic ligament. Mr. J. S. Levis: (1) A case of painful feet after gonorrhœa; (2) a specimen of an enlarged thymus from a child of 11 months who died under an anæsthetic. Mr. W. G. Mumford: A specimen of tumour of the left maxilla removed by operation. Mr. C. Kindersley: A specimen of carcinoma of the male breast.

THE PRESENT STATE OF KNOWLEDGE CONCERNING VITAMINS.

THE second edition of No. 38 in the Special Report Series of the Medical Research Council,[1] issued five years after its original publication, is a document of importance in more than one respect. The personnel of the Committee which drew up the 1919 report remains unaltered, except that three names—Mr. W. B. Hardy, Dr. A. W. J. MacFadden, and Prof. C. J. Martin—have been added to it. The fact that additions to the report are more numerous than revisions, and that the masterly introduction to the subject remains almost unchanged, indicates that the mass of work published since 1919 has not materially altered the conception of vitamins set out so clearly in the first edition. As is pointed out, the monograph first appeared at a time when the importance of vitamins was by no means universally recognised. Some critics felt that, in any case, the claims made by the writers of the monograph were too extensive. Those, however, who possessed first-hand acquaintance with the observations and experiments which formed the basis of the statements made were not of this opinion. They were then relatively few; they are now very numerous. Instead of being, as then, almost confined to this country and the United States, actual investigators of the facts are now to be found in nearly every civilised country. Advances have been made, especially in our knowledge of the origin and distribution of vitamins, and the conditions which determine their stability. Much progress has been made also along lines which bring experimental studies into immediate touch with clinical observations and practical experience. The isolation of vitamins in a pure state, however, as yet remains unaccomplished.

The general plan of the monograph remains unchanged except in a few minor details. References do not now follow each chapter, but are more conveniently collected at the end of the book. Vitamin A has now a chapter to itself, following the chapter recording early experimental work on the differentiation of vitamins, which, being mainly historical, has suffered but little change in this edition. Beri-beri and scurvy are dealt with in separate chapters, with vitamins B and C respectively, and the chapter on rickets as a deficiency disease is brought forward to follow these from its former position after the discussion on the Application of Experimental Work to the Practical Problems of Human Diets. This discussion is divided into two sections as before, the relation of vitamins to the dietetic problems of adults differing widely from their paramount importance in the nutrition of infants.

The discussion of pellagra, provisionally included in the first edition among the diseases possibly due to a vitamin deficiency, has been omitted from the second edition. The reason for the omission is that while pellagra must still be regarded as a disease of dietetic origin, no fresh evidence has been brought forward in support of that view, and the latest researches upon the subject point to a quantitative or qualitative defect in the protein of the diet as playing the chief part in the ætiology of this disease.

The influence of diet on teeth is discussed in a brief final chapter. The report has been edited by Prof. A. Harden, F.R.S., to whom the thanks of the Committee are extended.

Vitamin A.

It is admitted that in the present state of our knowledge the nomenclature of the fat-soluble vitamin or vitamins presents some difficulty if confusion is to be avoided. In this report the term

[1] Report on the Present State of Knowledge concerning Accessory Food Factors (Vitamins). Compiled by a committee appointed jointly by the Lister Institute and the Medical Research Council. Second edition. H.M. Stationery Office. 4*s*. 6*d*.

"vitamin A or fat-soluble A" is used to denote the accessory food factor necessary to promote growth, and prevent and cure xerophthalmia (in rats) upon a diet adequate in all other respects. The distribution in natural foodstuffs of this vitamin, its origin and physiological significance, its properties, and the attempts made at its isolation form the substance of Chapter III. While the antirachitic vitamin appears to have a similar distribution to vitamin A, the former term is here used to define a fat-soluble vitamin especially concerned with the calcification of bone, and the properties of this antirachitic vitamin are discussed in Chapter VI. on Rickets. All that is definitely affirmed is that an antirachitic vitamin similar in many respects to vitamin A is a central factor in the machinery of rickets; and the nomenclature outlined above is adopted provisionally and without prejudice to the question of the actual existence of two or more distinct fat-soluble vitamins.

Much work has been done since the issue of the original report on the distribution of vitamin A. The primary sources of this vitamin are found to be in the green leaves of plants and in marine algæ, which are now, with butter, cod-liver oil, colostrum, cod roe, yolk of eggs, and marine diatoms, credited with three crosses, as rich sources of this vitamin. In view of the preference of some veterinary surgeons for unpurified oils, the statement that there is no foundation for the belief that dark-coloured oils contain more vitamin A than "white" oils is of interest. The vitamin content of butter, cream, lard, mutton and beef fat, and milk varies with the diet, breed, and management of the animal from which these are derived. Great interest is attached to the origin and function of the large stores of vitamin A found in the liver of the cod and of many other fish. Fish, like mammals, probably derive the whole of their vitamin A either directly or indirectly from the vegetable kingdom. Investigation has shown that a marine diatom (*Nitzschia closterium*, W. Sm.) is capable of synthesising the vitamin when grown in sterilised sea-water in the light, and further that the concentration of vitamin attained in these organisms is very high. Many other marine algæ also contain the vitamin. These vegetable organisms are not directly devoured by the cod, but form the food of a host of minute animals (copepods, amphipods, larval decapods, and mollusca), which in their turn are eaten by many kinds of small fish and other marine animals, salps, squids, and certain molluscs, and these finally are taken by the cod and other fish. In the cod the vitamin is not confined to the liver, but in the period preceding spawning is found in considerable concentration in the roe, both hard and soft, daily doses equivalent to 0·025 g. and 0·05 g. respectively of the fresh soft and hard roe being sufficient to cause resumption of growth in rats. These amounts should be compared with the 0·2 g. of butter fat and 1–2 mg. of cod-liver oil required for the same purpose.

Isolation.—The greatest progress in this direction is afforded by the discovery that vitamin A remains in the unsaponifiable residue when the fat is hydrolysed in absence of air. When the cholesterol is removed by crystallisation or by precipitation with digitonin the whole of the vitamin is left behind along with the non-cholesterol fraction of the unsaponifiable residue, the exact chemical nature of which is not known. The close relation which exists between the presence of vitamin A in fats and the well-known reaction given by liver oils (the production of a purple coloration when the oil is dissolved in an organic solvent and a drop of sulphuric acid is added) has been pointed out. The intensity of the reaction was found to be roughly proportional to the vitamin-A content of a series of fish-liver oils. It is obvious that there is a close parallel between the two properties, but the necessity for caution is indicated by the fact that although the marine diatom *Nitzschia* has been shown to be rich in vitamin A, the oil extracted from this organism did not give the purple-colour test with sulphuric acid.

Vitamin B.

Though the identity of water-soluble B vitamin and the antineuritic factor are not absolutely established, it is now generally accepted; in this edition of the report they are provisionally regarded as identical. The tables indicating the distribution of this vitamin compiled from preventive and curative experiments on pigeons are mostly unchanged in this edition, but new observations confirming the high resistance to heat and to desiccation of this vitamin are recorded. As to the vitamin-B content of milk, discrepancies between the findings of Gowland Hopkins and those of Osborne and Mendel are recorded, the cause of the discrepancy not having yet been discovered. Attempts at isolation of this vitamin have not been successful. The power to synthetise the substance is possessed generally by plants. Yeast, as is well known, constitutes one of the richest known sources of this vitamin, but the question whether yeast synthesises the substance or merely absorbs it from the medium in which it is grown has not yet been decided, conflicting results having been obtained by different observers.

Vitamin C.

The classical history of the development of the conception of scurvy as a deficiency disease is again recorded and, indeed, can never grow stale. The histological changes in experimental guinea-pig scurvy are set out at some length in this edition, and illuminating diagrams of the changes at the rib-junction are reproduced from a paper published by F. M. Tozer.

The table indicating the distribution of vitamin C in foodstuffs is greatly extended, showing how much work has been done in this connexion since 1919. The substances now regarded as richest in this vitamin include raw fresh green cabbage leaves, swede juice, sprouted cow peas, grape fruit juice, lemon juice fresh and dried, naartje juice, orange juice fresh and dried, raw tomato, tomato juice (tinned). It is noteworthy that grapes have a very low antiscorbutic value. Tomatoes grown in South Africa were found by Delf and Pullinger (unpublished results) to be much less potent than those grown in England. Milk is by no means rich in antiscorbutic. Since fresh cow's milk cannot be considered as having a definite antiscorbutic value, its potency varying considerably with the diet of the cow, the weak point in the many experiments designed to investigate the antiscorbutic properties of various dried milks is that no comparison has been made between the anti-scorbutic potency of samples of the same milk before and after drying. It seems probable on the whole that dried milks of very varied potency are placed on the market, and no generalisation can be made on the subject. Spray process milks may possibly be less effective than roller process, owing to the greater opportunities for oxidation during the treatment.

Boiled milk has not been very thoroughly examined. The effect of pasteurisation on the antiscorbutic vitamin of milk, and in particular the relative effect of different processes, still awaits experimental investigation.

As to resistance to heat and oxidation, vitamin C is very sensitive to oxidising agents. The addition of either acid or alkali to the water in which vegetables are boiled appears to increase the loss of antiscorbutic property. Fruit juices may be dried without serious loss by evaporation in vacuo. The only important fact known about the origin of vitamin C is that it is produced during the germination of seeds.

Rickets.

The work on rickets undertaken since 1919 has been important but has not tended to simplify the problem of its ætiology. The present position is discussed under different headings and summarised as follows:—

Recent work on rickets has proved that there are two outstanding factors involved in the ætiology of this disease: 1. The amount of a substance (antirachitic vitamin) in the diet having similar physical properties and distribution to vitamin A. 2. The degree of exposure to sunlight. In addition, the American school of workers, as the result of

work with rats, has laid great stress on the absolute and relative amounts of calcium and phosphorus in the diet. Mellanby, working with dogs, attached much importance to the amount and type of energy-bearing foodstuffs and more particularly the amount and type of cereals eaten.

It is clear that both the antirachitic vitamin and sunlight are normally concerned in the deposition of Ca and P in growing cartilage and bone. Animal experiments prove conclusively that they are capable of correcting deficient and unbalanced quantities of these elements in the diet and bringing about the formation of normal bone. Much of the recent experimental work employing rats has centred round the influence of diets with a defective calcium-phosphorus ratio. It is not clear, however, to what extent a faulty calcium-phosphorus intake, either from the point of view of absolute or of relative quantities, is of practical importance in the causation of human rickets. Rickets develops in children even when ingesting a fair amount of cow's milk in which the amount of these elements is in excess of their requirements and the relative proportion satisfactorily adjusted. In the case of diets consisting largely of cereals, however, such is not the case, and, in this instance, defective intake of calcium and phosphorus may well be a contributory cause of rickets.

The importance of the antirachitic organic factor in diet and of exposure to light has been abundantly demonstrated both by laboratory experiment and by clinical observation. Cod-liver oil, the richest known source of the antirachitic vitamin, has been proved by well-controlled observations to have a specific prophylactic and curative value. Similarly, but to a less degree, milk, eggs, and butter have definite antirachitic actions. Cow's milk and butter appear to show great variation in their antirachitic properties, depending upon the diet and management of the cow. The point is one of great importance and needs further investigation, but our present knowledge indicates that pasture-fed cows —i.e., animals receiving fresh green food and exposed to sunlight—produce a milk comparatively rich in both growth-promoting and antirachitic properties.

The question as to whether the antirachitic factor and vitamin A are one or two substances is at the present time under discussion. The points of similarity and dissimilarity as regards their properties and distribution have been discussed. It cannot be said that unanimity of opinion on this matter has yet been reached. Sunlight and other forms of light radiation (mercury vapour lamp, carbon arc lamp) have been shown to possess preventive and curative effects on rickets comparable in many respects with those of cod-liver oil. The interaction of sunlight and the antirachitic vitamin has been described above. In infants and in experimental animals sunlight acts in the direction of correcting the effect of an imperfect diet only if the defects are not too severe. Thus the light radiation may be regarded either as an economiser of the antirachitic vitamin or as a mobiliser of reserve supplies in the tissues. Sunlight appears to make safe some diets which are relatively deficient in antirachitic vitamin.

It is now intelligible why rickets is a comparatively rare disease both in natives living under tropical conditions and in the inhabitants of the Arctic circle. The extra sunshine experienced by the one set of people makes the smaller amount of calcifying vitamin in their diet do the work carried out by the larger vitamin intake of the Esquimo. People living in the temperate zone under modern industrial conditions of diet are often poorly supplied with both these therapeutic agents, and an intelligent application of the facts which have come to light as the result of recent scientific investigation may confidently be expected to result in the prevention of one of the most serious diseases to which urban populations are liable.

Diet of Adults and Infants.

The chapters indicating the application of experimental work to the diet of adults and infants have been extended in parts, notably the sections on osteomalacia and night-blindness, following on the work on the under-nourished population in Austria, Russia, and Japan, but their main conclusions remain unmodified. The final chapter on the influence of diet on teeth records the results of work by M. Mellanby on puppies, which, if it can be applied to humans, indicates that the correct feeding of women during pregnancy and of children during the development of the teeth should result in the production of teeth perfectly calcified and evenly arranged in the mouth. If, as seems likely, defectively formed teeth have less resistance to caries, the suggestion seems a natural one that one cause of the great amount of disease in the teeth of children is malformation consequent on bad feeding. Dental authorities have criticised this point of view severely, stating that examination of children has shown that only 3 per cent. possess hypoplastic or badly formed deciduous teeth, while 90 per cent. have teeth ultimately affected by caries. The examination which led to this result was, however, of a macroscopic nature, and M. Mellanby obtained microscopical results in 302 deciduous teeth of children, which appear to show a direct relationship between faulty structure and caries.

Medical News.

ROYAL COLLEGE OF PHYSICIANS OF LONDON AND SURGEONS OF ENGLAND.—As the result of the Final Examination of the Conjoint Board held from Jan. 8th to Feb. 4th, the following candidates were approved in the undermentioned subjects, but are not eligible for diplomas :—

Medicine.—H. G. Anderson, F. Asker, and A. Barnsley, St. Bart.'s; P. Bauwens, St. Thomas's; R. Bolton, St. Bart.'s; W. R. Bowen, Middlesex; A. J. S. L. Boyd, St. Thomas's; Gwenddolen J. Brooke, Univ. Coll.; Doris D. Brown, Royal Free and St. Mary's; G. H. Buncombe, St. Bart.'s; Edna V. Butler, Bristol; Fanny L. Cattle, Univ. Coll.; J. Chronnell, Manchester; Edith I. Clark, G. E. C. Collis, and H. A. Cowan, Univ. Coll.; S. H. Currie, London; D. Davies, Guy's; D. V. Davies, St. Thomas's; E. C. Dawson, Birmingham; C. H. Devereux, Univ. Coll.; N. B. Dreyer, St. Bart.'s; E. F. Duck, Univ. Co.l.; W. H. du Plessis, St. Thomas's; R. H. Dyer, King's Coll.; C. J. East and H. E. K. Eccles, St. Bart.'s; W. S. D. Elder, St. Andrews and St. George's; G. E. Ellis, St. Bart.'s; Marguerite Elman, St. Mary's; T. P. Evans, Charing Cross; C. A. Francis, St. Bart.'s; Dorothy E. Galbraith, Royal Free; E. B. Garrett, Univ. Coll.; H. Geary, Guy's; W. T. McN. Gentle, St. Mary's; B. Green, Charing Cross; J. L. Griffin, Bristol; N. W. Hammer, Middlesex; J. Hartsilver, St. Bart.'s; L. B. Haye, Univ. Coll.; F. Heckford, St. Bart.'s; R. F. L. Hewlett, King's Coll.; Barbara J. Hick, St. Mary's; Barbara M. Hope, King's Coll.; L. W. Houghton, Guy's; Bessie G. Jemson, London; C. M. Jennings, St. Bart.'s; D. Jones, London; I. Kinsler, St. Bart.'s; J. H. Kok, Middlesex; J. H. R. Laptain, St. Bart.'s; Nancy R. Lewis, Royal Free and St. Mary's; D. T. Lloyd, St. Bart.'s; H. Lord, Univ. Coll.; W. J. E. Lupton, St. George's; E. M. McCausland, Middlesex; A. F. McGlashan, St. George's; G. A. McKaig, St. Thomas's; Lily C. MacKinnon, Charing Cross; R. B. McVicker, St. Thomas's; W. A. Mill, Guy's; J. B. Oldham, and D. U. Owen, Liverpool; G. F. S. Parker, Manchester; A. E. Parkes, St. Bart.'s; W. Parry-Jones, London; H. W. Pearson, St. Bart.'s; Winifred M. Proctor, Durham; G. Ralston, London; M. A. Rana, St. Mary's; H. D. C. Rice, King's Coll.; Lilian E. Robinson, Univ. Coll.; F. W. Roques, Middlesex; Kathleen Shelton, Durham; I. Spiro, Univ. Coll.; L. Statnigrosch, Middlesex; E. V. Suckling, London; G. E. F. Sutton, King's Coll.; Portia K. Taylor, Univ. Coll.; A. Tom, Guy's; G. M. Tothill, Charing Cross; J. R. Tree, Middlesex; Mary M. Turnbull, King's Coll.; C. A. van Rooyen, London; I. R. Vermooten, Guy's; Constance Walters, Cardiff; M. A. Weisman, Manchester; Mary A. Wiles, King's Coll.; G. Williams, St. Mary's; Dorothy Wood, Charing Cross; H. G. Wyatt, London; and Muriel M. Yates, St. Mary's.

Surgery.—S. Abadir, King's Coll.; H. G. Anderson, St. Bart.'s; J. H. Anderson, Manchester; H. Aukland, Liverpool; V. Barkin, St. Bart.'s; St. C. E. J. Barrett, Middlesex; Margarida R. Bensaude, Birmingham; A. G. Bewes, St. Thomas's; W. H. Bradley and R. J. Cann, Guy's; A. N. Coomarasamy, London; D. A. L. Crawshaw and J. C. G. Dickinson, Guy's; Kathleen H. Durance, Royal Free; H. S. Edwards, St. George's; Phyllis V. L. Epps, Royal Free; T. I. Evans, St. Thomas's; W. Evans, London; C. J. Fox, St. Mary's; F. G. France, St. Bart.'s; J. H. Francis, St. Mary's; A. G. D. Gavin, St. Thomas's; W. H. Gervis, Cambridge and St. Thomas's; J. F. Goodenough, Guy's; C. A. H. Green, St. Bart.'s; C. W. Healey, Liverpool; H. N. Hearle, Guy's; D. V. Hubble, St. Bart.'s; J. N. Hudson, Manchester; G. C. Hughes, Guy's; J. G. Hume, St. George's; W. S. Hunt, Guy's; A. G. Hyde, Sheffield; E. Jacobson, London; D. J. Jones, St. Thomas's; D. S. M. Jones and H. M. R. Jones, Middlesex; A. Jowell, Guy's; Dorothy L. M. Keats, Royal Free; D. E. Keefe and A. C. King, London; F. H. King, St. Bart.'s; M. C. H. Kingdon, St. Mary's; H. Levit and F. J. Levy, Guy's; K. S. Lim, Univ. Coll.; W. H. G. M. Line, St. Mary's; Elsa P. Lunn, Birmingham; D. M. Mackay, Middlesex; J. G. McMenamin and D. G. Martin, St. Bart.'s; F. Martin, Guy's; C. A. Moody, St. Bart.'s; G. O. Morgan, King's Coll.; Doris E. O'Doherty, Royal Free; K. O. Parsons, Guy's; E. A. T. Pateman, Charing Cross; T. Peirson, Manchester; A. Perkoff, London; D. B. Phillips and L. M. J. R. Pilot, St. Thomas's; E. B. Pollard and F. K. B. Quanbrough, St. Bart.'s; R. H. T. Rea, Cambridge and St. Thomas's; E. J. Rees, St. Thomas's; R. E. Robinson, Guy's; W. E. Rodgers, London; A. Sherning, Cambridge and St. Thomas's; A. D. H. Simpson, St. Bart.'s; A. E. Smith, Univ. Coll.; R. F. Smith, Guy's; G. G. Stewart, St. Bart.'s; H. Taylor and C. Thomas, London; O. F. Thomas, Manchester; W. G. Thwaites, St. Thomas's; D. S. Todd-White, Guy's; Hermione M.

Usborne, Royal Free; L. C. D. Van Der Borght, Ghent; Dorothy M. Vaux, Royal Free; J. L. le C. Walker and H. C. Warner, Guy's; J. L. Warner, Middlesex; W. Wilkinson and T. J. Wilson, St. Bart.'s; T. E. W. R. Wood, London; and Z. M. Yusef, St. Bart.'s.

Midwifery.—W. M. Abdel-Malek, Birmingham; H. M. Allen, McGill; C. A. Amesur, St. Thomas's; A. J. Amor, Middlesex; J. H. Anderson, Manchester; S. M. Anderson, Middlesex; E. C. Archer, St. Thomas's; F. Asker, St. Bart.'s; E. A. Aslett, St. Mary's; H. Aziz, Manchester; R. M. Barron and P. Bauwens, St. Thomas's; P. S. Bell, Westminster; R. J. I. Bell, St. Bart.'s; Margarida R. Bensaude, Birmingham; P. C. Bennison, Guy's; H. E. Blake, Guy's; W. R. Blunt, St. Thomas's; P. G. Brain, London; A. D. Briscoe, St. Thomas's; J. H. Broadhead, Guy's; T. H. P. Brooks, London; A. C. Brown, St. Bart.'s; D. M. Brown, Birmingham; G. A. H. Buttle and C. W. Carter, Univ. Coll.; J. Carver, London; T. E. Cawthorne, W. T. R. Chapman, and F. W. Charman, King's Coll.; M. N. Chatterjee, Birmingham; R. J. K. Chattey, Middlesex; Gwendoline Chave, St. Mary's; F. E. Chester-Williams St. Bart.'s; A. M. Claye and F. Clegg, Leeds; Doris M. Collins, Royal Free; L. C. Cook and W. S. C. Copeman, St. Thomas's; H. A. Cowan, Univ. Coll.; E. J. Creais and M. Cutner, St. Mary's; R. R. Dalling, Liverpool; S. H. Daneel, Guy's; H. E. Daniel, St. Bart.'s; A. F. C. Davey, Manchester; A. Davies, Middlesex; E. W. P. Davies and J. Davies, Westminster; S. C. Davison, Guy's; R. Y. Dawbarn, Liverpool; E. C. Dawson, Birmingham; Charlotta D. N. De Wilde, London; N. A. Dickinson, Manchester; J. M. Dobie, St. Thomas's; J. Dreadon, Otago; G. D. Drury, St. Bart.'s; Margaret H. Duncan, London; S. F. Durrans, Guy's; C. J. East, St. Bart.'s; A. B. Eddowes and H. Scott-Edwards, St. George's; J. E. Elam, St. Bart.'s; W. S. D. Elder, St. George's; O. M. Ellis, Cardiff; J. B. Ellison, St. George's; H. G. English, Univ. Coll.; G. I. Evans, Manchester; D. W. G. Faris, London; N. B. Farman, Charing Cross; W. J. C. Fenton, London; J. W. Field, Birmingham; F. E. Fox, London; D. B. Fraser, St. Bart.'s; T. M. Fripp, Guy's; C. J. Fuller, Univ. Coll.; F. F. Fuller, Liverpool; J. A. Galletly, Middlesex; M. Geaney, Sydney; N. C. Ghose, Middlesex; G. Gillett, Univ. Coll.; A. Glen and I. Gluckman, London; B. Green, Charing Cross; C. A. H. Green, St. Bart.'s; A. L. Greenway, King's Coll.; W. J. Griffiths, Liverpool; K. H. A. Gross, St. George's; Kathleen M. Halloran, Royal Free; J. F. Hamber, King's Coll.; C. L. Harding, St. Bart.'s; H. E. Hargreaves, Charing Cross; S. Harris, St. Thomas's; C. W. Healey, Liverpool; F. Heckford, St. Bart.'s; S. Helberg, Zurich and London; J. P. Helliwell, St. Mary's; R. F. L. Hewlett, King's Coll.; Barbara J. Hick, St. Mary's; H. Hinehco, Middlesex; L. W. Houghton, Guy's; J. N. Hudson, Manchester; Theresa H. Humphries, Royal Free; J. T. Hunter, St. Bart.'s; W. E. Hunter, Manchester; J. Hwa, Birmingham; A. G. Hyde, Sheffield; E. Jacobson, London; J. S. Jacobsz, Guy's; J. W. Jeffery, St. Mary's; Mary Jennings, Royal Free; C. W. W. Jeremiah, Middlesex; H. A. Johnson, Birmingham; F. M. L. Jones, London; Helen V. Jones, St. Mary's; L. E. Jones, St. Thomas's; R. M. Jones and A. Jowell, Guy's; D. L. J. Kahawita, King's Coll.; Dorothy L. M. Keats, Royal Free; G. W. Keele, Univ. Coll.; C. E. Kilmister, St. Thomas's; F. H. King and J. F. L. King, St. Bart.'s; J. G. Kingsbury, Guy's; P. H. Knowles, Bristol; T. C. Lewis, St. Bart.'s; K. S. Lim, Univ. Coll.; W. E. Lock, Middlesex; G. K. Loveday, St. Bart.'s; C. J. Lovering, Middlesex; E. S. S. Lucas, St. Thomas's; Elsa P. Lunn, Birmingham; Gladys E. McCabe, Royal Free and St. Mary's; J. McCunn, London; W. S. Macgowan, Middlesex; R. R. Mackenzie, Guy's; D. Magrath, Birmingham; J. R. Maleri, St. George's; J. L. B. Marais, St. Bart.'s; Evelyn D. May, Birmingham; L. M. Maybury, Univ. Coll.; Gertrude M. Mayhall, Leeds; B. A. J. Mayo, St. Bart.'s; S. P. Meacock, Guy's; A. W. C. Mellor, St. Bart.'s; J. D. Mills, Oxford and St. Thomas's; G. G. Milne, London; W. J. Montague, Guy's; J. G. Morgan, Univ. Coll.; C. A. Mulligan, Manchester; E. L. Newell, St. Thomas's; J. A. Noot, Cardiff; M. C. O'Connor, St. George's; Doris E. O'Doherty, Royal Free; G. C. B. Oliver, St. Mary's; L. J. Panting, Middlesex; W. F. C. Parry, Univ. Coll.; E. A. T. Pateman, Charing Cross; R. Paton, Middlesex; F. L. Patterson and Sybil de H. R. Pattison, London; R. M. Pearce and T. Peirson, Manchester; M. S. Pembrey, St. Bart.'s; J. E. Piercy, Guy's; K. F. Platt, Bristol; L. M. J. R. Pilot, St. Thomas's; G. H. Pitt, Guy's; L. Platzky, B. Policovsky, and T. B. Prys-Jones, Middlesex; C. Rankin, Liverpool; R. J. Rankin, Cardiff; F. C. Read, King's Coll.; W. Richards, St. George's; D. Riley, St. Thomas's; J. B. W. Roberton, St. Bart.'s; W. M. Roberts, Manchester; W. G. Roberts, Guy's; C. H. H. Robertson and G. R. Rolston, London; F. W. Roques, Middlesex; Alysoun H. Rowntree, Royal Free; Winifred M. Sampson, Univ. Coll.; H. B. Savage, St. Bart.'s; C. M. Scott, Charing Cross; S. Q. Servante, Middlesex; A. B. Slack, Manchester; K. S. M. Smith and J. S. Spickett, St. Bart.'s; A. A. Spiro, Manchester; R. Stanford, London; R. Stuart, St. Bart.'s; K. H. Tan, Middlesex; Catharine F. Taylor, Royal Free; E. W. P. Thomas, St. Thomas's; J. E. Thomas, Cardiff; W. S. Thomas, Univ. Coll.; F. S. Thornton, St. Thomas's; P. W. Tobin, St. Mary's; P. G. Trafford, T. G. Tresidder, and L. A. S. Trott, Guy's; E. J. Warburton, Manchester; H. A. Ware, St. Bart.'s; H. C. Warner, Guy's; R. L. Washington, Birmingham; M. A. Weisman, Manchester; Joyce E. M. White, London; V. E. Whitman, Cardiff; C. R. Williams, London; H. K. Williams, Guy's; R. E. Wolfendale, Manchester; J. Wood and H. M. Woodman, King's Coll.; G. P. Wright, Univ. Coll.; A. J. Wrigley, St. Thomas's; and H. G. Wyatt, London.

UNIVERSITY OF LONDON.—Dr. Charles Singer, lecturer in the history of medicine at University College and Hospital, will give three lectures, illustrated by lantern slides, on Mondays, Feb. 25th, March 3rd and 10th, at 5 P.M., in the large lecture theatre, University College Hospital Medical School, Gower-street, W.C. 1. The lectures are open to all students of the University of London, and the subjects are (1) the history of syphilis, (2) the history of plague, and (3) the history of small-pox and its relation to inoculation and vaccination.

A course of four lectures on Blood will be given by Prof. B. J. Collingwood at St. Mary's Hospital Medical School, on Thursdays, Feb. 21st, 28th and March 6th and 13th at 5 P.M. Attendance at this course is recognised in connexion with the B.Sc. (Hons.) degree in physiology. Admission is free.

MEDICO-LEGAL SOCIETY.—A meeting of this society will be held at 11, Chandos-street, Cavendish-square, London, W., on Tuesday, Feb. 19th, at 8.30 P.M., when a discussion on the Law of Nullity of Marriage will be opened by Dr. S. Henning Belfrage, followed by Mr. H. W. Barnard.

ST. MARK'S HOSPITAL.—The eighty-eighth annual general meeting of this hospital was held at the Mansion House, London, on Feb. 8th, when an appeal was made for a balance of £12,000 for the extension of the hospital buildings in the City-road. This extension would enable the governors to provide another 21 beds and would also add to the accommodation for out-patients, 1184 of whom made 3951 attendances last year. Further information can be obtained from the Secretary, St. Mark's Hospital for Cancer, Fistula, and other Diseases of the Rectum, City-road, London, E.C. 1, to whom contributions should be sent.

MANCHESTER BABIES' HOSPITAL.—Post-graduate lectures at this hospital are being held on alternate Fridays until April 11th. To-day (Friday), Feb. 15th, Dr. W. Dyson will lecture on Fungus Infections in Children. On the 29th Dr. Catherine Chisholm will give a demonstration of the Treatment of Rickets by the Mercury Vapour Lamp, with Radiographic Illustration of Repair in Rachitic Bone. On March 14th Dr. Nesta Wells will speak on Infection in Infants' Wards. On the 28th Dr. C. E. Jenkins will discuss Vaccines and their Use in the Treatment of Infants, and on April 11th Dr. Chisholm will deal with Complications met with in the Treatment of Marasmic Infants. The lectures will be held at 5.30 P.M.

ROYAL SANITARY INSTITUTE: RECEPTION TO FOREIGN HEALTH OFFICERS.—The reception arranged at the Institute on Tuesday, Feb. 5th, for the medical officers visiting this country under the auspices of the League of Nations, proved a great success. Representatives were present from the Argentine, Austria, Czecho-Slovakia, Denmark, Ecuador, Esthonia, France, Germany, Italy, Latvia, Norway, Poland, Portugal, Roumania, Russia, Sweden, Ukrainia, and the United States of America. The guest were received by Sir John Cockburn and Dr. Louis Parkes, and among those present were four medical Members of Parliament, Dr. W. A. Chapple, Dr. L. Haden Guest, Dr. E. G. Spero, and Dr. J. H. Williams, three officers of the Ministry of Health, representatives of the League of Nations Union, Surgeon-Commander T. B. Shaw, R.N., Royal Naval College, Greenwich, and Mr. P. G. Blazer, secretary of the Labour Party Public Health Subcommittee. The medical officers spent a week in London visiting places of hygienic interest, and then divided into small groups to visit some of the large towns, returning to London in April.

MEDICAL SOCIETY OF LONDON: *Lettsomian Lectures, 1924.*—The syllabus of the Lettsomian Lectures on the Treatment of Pulmonary Tuberculosis by Dr. R. A. Young has now been issued. The first lecture, to be delivered on Feb. 18th, at 9 P.M., will deal with the history of the treatment of pulmonary tuberculosis; the nature and origin of the disease—variations in type; the principles of treatment and the forms of treatment available; and the choice of treatment for individual cases. Home, hospital, sanatorium, and climatic treatments will be discussed, also general management and diet, and the rôle of rest and of exercise. The second lecture on March 5th will be devoted to curative treatments: (1) Specific—tuberculin, serums, and vaccines; (2) chemiotherapy; (3) organotherapy; (4) mineral treatment; (5) physical treatments—heliotherapy, other light treatments and X rays, symptomatic and palliative treatments, managements of advanced cases, after care and vocational training. At the third lecture on March 17th mechanical and surgical methods of treatment will be discussed, including local limitation of movement; artificial pneumothorax treatment—indications and contra-indications; thoracoscopy and the method of dealing with adhesions; phrenicotomy; pneumolysis and apicolysis; thoracoplasty—its varieties, indications, and contra-indications; other surgical procedures; the rôle of surgery in the treatment of pulmonary tuberculosis.

HUNTERIAN SOCIETY.—The annual dinner of this society was held on Tuesday evening, Feb. 12th, at the Hotel Victoria, London, when Sir Bruce Bruce-Porter presided over a large and successful function, at which many ladies were present. Sir Humphry Rolleston, in giving the toast of the Hunterian Society, congratulated the members on the rapid increase in their numbers, and commended the principles under which the society was managed as conducing to intimate interchange of views. Sir Bruce Bruce-Porter replied briefly, and introduced, for the first time in Hunterian celebrations, the personality of MRS. John Hunter, whose coöperation and sympathy were of such value to her husband in his arduous life. Mr. John Adams proposed the health of the Lord Mayor of London, who had, like previous Lord Mayors, shown much kindness to the society, when Sir Louis Newton, in his reply, pointed out that the public health of the City was a legitimate source of civic pride. Dr. H. A. Ellis, speaking to the toast of the sister societies, to which Sir William Hale-White replied, made a stirring appeal for a real union between the mother country and the dominions, his words being received with great applause. Dr. Howard Humphris was brief and witty in his introduction to the company of their guests, for whom Viscount Long, Mr. Justice Horridge, and Mr. Hugh Edwards, M.P., replied. The dinner closed with tributes to the President and Dr. Mortimer Woolfe, the hon. secretary of the society.

PEOPLE'S LEAGUE OF HEALTH.—The Sims Woodhead series of ten weekly constructive educational health lectures are being held at the house of the Medical Society of London, 11, Chandos-street, Cavendish-square, London, W. On Feb. 18th Prof. M. S. Pembrey will deal with the Anatomy and Physiology of the Circulatory and Respiratory Systems, and subsequent lectures will be given by Sir Frederick Mott, F.R.S., Sir Harry Baldwin, Prof. J. C. Drummond, Dr. J. Mellanby, Sir W. Arbuthnot Lane, Prof. H. R. Kenwood, Mr. E. B. Turner, and Dr. A. F. Tredgold.

THE ENDOWMENT OF A HOSPITAL BED: THE POWER OF A FARTHING.—A farthing per week fund subscribed by employees in the Dunlop factories has produced £100 (96,000 farthings) to endow a bed in the Birmingham and Midland Area Hospital for Children. The Council of the Dunlop Hospital and Benevolent Fund, with whom the idea originated, have decided to use one-third of the farthings collected from their thousands of workers for orphanages and other charities, the remainder being devoted to the endowment of beds in the various local hospitals. It is hoped that within a few years the weekly offering of farthings will have enabled the fund to endow a bed in each Birmingham hospital. The idea might well be imitated by other industrial undertakings throughout the country.

GLASGOW UNIVERSITY.—Sir Leonard Rogers, who is secretary of the British Empire Leprosy Relief Association, delivered a lecture in the medicine class-room of the University on Feb. 6th. The lecturer pointed out that the lepers of India were distributed in relation to the rainfall, except in districts where the houses were not thickly aggregated, and that this association was explainable on the assumption that the bacillus required moist heat for its most favourable growth. The modern conception of the disease was that it was neither infectious nor hereditary, and only a trifling number of those who lived in close association with lepers developed the disease. He then described the principle underlying the treatment of leprosy by means of intravenous injections of the active principle of chaulmoogra oil, in the form of the soluble salt, sodium chaulmoograte. A similar lecture was given by Sir Leonard Rogers at the weekly luncheon of the Glasgow Rotary Club on Feb. 5th.

THE Glasgow Western Infirmary Resident's Club held its annual dinner and meeting on Feb. 8th under the presidency of Dr. J. Galbraith Connal. About 70 old residents were present.

ABERDEEN MEDICO-CHIRURGICAL SOCIETY.—A clinical meeting of this society was held in the society's hall on Feb. 7th, Dr. G. M. Duncan, the President, in the chair. Dr. W. F. Croll showed a case of congenital heart disease, and briefly commented on the differential diagnosis of four groups of such cases. Prof. Ashley Mackintosh demonstrated a case simulating carcinoma ventriculi, in which, however, the blood count was more suggestive of pernicious anæmia. Mr. Gordon Bruce showed a case of Charcot's disease, affecting the knee-, elbow-, and finger-joints. Dr. J. F. Christie demonstrated a series of cases of skin disease which included xanthoma multiplex in an infant; lupus erythematosus; dermatitis exfoliativa complicated by pityriasis; rubra pilaris; lichen planus annularis; ulcus rodens superficialis; and an unusual form of lupus vulgaris.

Parliamentary Intelligence.

HOUSE OF COMMONS.

TUESDAY, FEB. 12TH.

PARLIAMENT reassembled on Tuesday, Feb. 12th.

Small-pox Outbreak.

Sir KINGSLEY WOOD asked the Minister of Health what steps he was taking to deal with the serious outbreak of small-pox in various parts of the country.—Mr. WHEATLEY replied: The responsibility for dealing with an outbreak of small-pox rests upon the local authorities and their officers. I may, however, say that at present there are only seven districts in which there is any considerable number of cases, and the medical officers of my department are rendering all possible assistance and advice to the authorities of the affected areas.

Supplies of Calf Lymph.

Mr. MARDY JONES asked the Minister of Health whether he was aware that private medical practitioners experienced difficulty in obtaining supplies of glycerinated calf lymph of the same guaranteed purity as that supplied to public vaccinators by the Ministry of Health; and, as many persons desirous of having vaccination or re-vaccination performed by their own medical advisers should have similar guarantees with regard to the purity of the lymph used by those extended to persons vaccinated by public vaccinators, would he take steps to secure the necessary powers to enable private medical practitioners to secure supplies of such lymph at a reasonable charge from Government sources.—Mr. WHEATLEY replied: As regards the first part of the question, I am advised that there is no difficulty in obtaining from reputable firms supplies of glycerinated calf lymph of reliable quality. The action suggested in the second part would involve a large and costly extension of the present Government supply which I am not prepared to recommend.

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES.

ROYAL SOCIETY, Burlington House, W.

THURSDAY, Feb. 21st.—4.30 P.M., *Papers to be read:* C. Tate Regan: The Morphology of a Rare Oceanic Fish, *Stylophorus chordatus* Shaw, based on Specimens collected in the Atlantic by the *Dana* Expeditions, 1920–22. F. P. Slater: A Sensitive Method for Observing Changes of Electrical Conductivity in Single Hygroscopic Fibres. (Communicated by Dr. W. L. Balls.) T. S. P. Strangeways: Observations on the Formation of Binuclear Cells. (Communicated by W. B. Hardy.) J. A. Crowther, Sc.D.: Some Considerations Relative to the Action of X Rays on Tissue Cells. (Communicated by W. B. Hardy.)

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

MEETINGS OF SECTIONS.

Tuesday, Feb. 19th.

GENERAL MEETING OF FELLOWS: at 5 P.M.
Ballot for election to the Fellowship. (Names already circulated.)

PATHOLOGY: at 8.30 P.M.
Communications:
Dr. Marshall Findlay: Experimental Biliary Cirrhosis produced by Salts of Manganese.
Dr. S. C. Dyke: Some Observations on Aleukia.
Mr. A. H. Drew: Growth-promoting Substances and Embryonic and Tumour Extracts.

Wednesday, Feb. 20th.

HISTORY OF MEDICINE: at 5 P.M.
Papers:
Mr. J. E. H. Roberts: The History of Trusses.
Dr. Charles Singer: A Chinese Coroner's Handbook of the Thirteenth Century.

Thursday, Feb. 21st.

DERMATOLOGY: at 5 P.M. (Cases at 4 P.M.)
Cases:
Dr. Ernest Dore: (1) Case of Darier's Disease; (2) Case of ? Darier's Disease (previously shown).
Dr. G. B. Dowling (introduced by Dr. Barber): A Rare Lingual Condition.
Other cases will be shown.

Friday, Feb. 22nd.

STUDY OF DISEASE IN CHILDREN: at Guy's Hospital, at 4.30 P.M.
Cases will be shown.

EPIDEMIOLOGY AND STATE MEDICINE: at 8 P.M.
Paper:
Lieut.-Colonel A. J. Williams, R.A.V.C.: Analogies between Influenza in Man and Influenza in Horses.
A limited number of copies of the paper are available. Apply to Dr. R. Dudfield, Town Hall, Paddington, W.

COMPARATIVE MEDICINE.
Members of this Section are cordially invited to attend the above meeting.

MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square, W.
MONDAY, Feb. 18th.—9 P.M., Dr. R. A. Young: (First Lettsomian Lecture) Treatment of Pulmonary Tuberculosis.

ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE, 11, Chandos-street, W.
THURSDAY, Feb. 21st.—8.15 P.M., Meeting preceded by a Demonstration, by Prof. F. K. Kleine of Various Trypanosomes at 7.45. The paper will be read by Prof. Kleine on his Recent Expedition to Africa to investigate the action of "Bayer 205."

THE MEDICO-LEGAL SOCIETY, 11, Chandos-street, W.
TUESDAY, Feb. 19th.—8.30 P.M., Dr. S. Henning Belfrage will open a discussion on the Law of Nullity of Marriage, to be followed by Mr. H. W. Barnard, Barrister-at-Law.

ROYAL INSTITUTION OF GREAT BRITAIN, Albemarle-street, W.
FRIDAY, Feb. 22nd.—9 P.M., Prof. G. Elliot Smith: The Human Brain.

SOCIETY FOR CONSTRUCTIVE BIRTH CONTROL AND RACIAL PROGRESS, John-street, Adelphi, W.C.
THURSDAY, Feb. 21st.—8 P.M., at Essex Hall, Strand, Dr. Maude E. Kerslake: Why We Want Clinics.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn-fields, W.C.
MONDAY, Feb. 18th.—5 P.M., Mr. C. P. G. Wakeley: Some Actions of Radiations on Living Tissues.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W. 1.
MONDAY, Feb. 18th, to SATURDAY, Feb. 23rd.—Combined Course on Diseases of Children. Clinical Demonstrations and Lectures from 10 A.M. to 4.30 P.M. daily, including the ROYAL WATERLOO HOSPITAL, VICTORIA HOSPITAL FOR CHILDREN, and PADDINGTON GREEN CHILDREN'S HOSPITAL.—CENTRAL LONDON OPHTHALMIC HOSPITAL. Clinical Lecture Demonstration every afternoon. Mon., 2 P.M., Mr. Oliver. Tues., 2.30 P.M., Mr. Gibb. Wed., 2.30 P.M., Mr. Neame. Thurs., 2.30 P.M., Mr. Cunningham. Fri., Mr. Williamson-Noble (Pathological).—LONDON LOCK HOSPITAL. Clinical work daily. Lectures at Dean-street as follows: Tues., 2.30 P.M., Mr. McDonagh: Clinical Demonstration with Exhibition of Paintings. Thurs., 2.30 P.M., Mr. Corbett: Interpretations of the Wassermann Reaction. 4.30 P.M., Mr. Abel: Some Complications of Gonorrhœa in the Male. Fri., 4 P.M., Mr. Abraham: Gonorrhœal Rheumatism.—LONDON SCHOOL OF TROPICAL MEDICINE. Tues., and Thurs., 2 P.M., Special clinical Demonstrations.

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith, W.
MONDAY, Feb. 18th.—10 A.M., Surgical Registrar: Surgical Pathology. 2 P.M., Mr. Bishop Harman: Eye Dept. 2.30 P.M., Dr. Saunders: Medical Wards.
TUESDAY.—11 A.M., Dr. McDougal: Electrical Dept. 12 noon, Dr. Burrell: Chest Cases. 2 P.M., Mr. Banks-Davis: Throat, Nose, and Ear Dept.
WEDNESDAY.—12.15 P.M., Dr. Burnford: Medical Pathology. 2 P.M., Dr. Owen: Medical Out-patients. 2.30 P.M., Mr. Donald Armour: Surgical Wards.
THURSDAY.—11 A.M., Mr. Simson: Gynæcological Demonstration. 12 noon: Mr. Simmonds: Demonstration of Fractures. 2 P.M., Mr. MacDonald: Genito-Urinary Dept.
FRIDAY.—10 A.M., Dr. Drummond Robinson: Gynæcological Operations. 10.30 A.M., Dr. Pritchard: Medical Wards. 2 P.M., Mr. Sinclair: Surgical Out-patients.
SATURDAY.—9.30 A.M., Dr. Burnford: Bacterial Therapy. 10 A.M., Dr. Saunders: Medical Diseases of Children.
Daily, 10 A.M. to 6 P.M., Saturdays, 10 A.M. to 1 P.M., In-patients, Out-patients, Operations, Special Departments.

ST. MARY'S HOSPITAL, Paddington, W.
THURSDAY, Feb. 21st.—5 P.M., Prof. B. J. Collingwood: First of four lectures on Blood.

ST. THOMAS'S HOSPITAL, Albert Embankment, S.W. (In the Governors' Hall.)
THURSDAY, Feb. 21st.—5 P.M., Dr. J. A. Murray: Cancer. (First of four weekly lectures.)

HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C.
THURSDAY, Feb. 21st.—4 P.M., Mr. Pitts: Oral Sepsis.

CANCER HOSPITAL, Kensington, S.W.
WEDNESDAY, Feb. 20th.—4.30 P.M., Dr. R. Knox: Recent Developments in Radiotherapy.

NATIONAL HOSPITAL FOR THE PARALYSED AND EPILEPTIC, Queen-square, Bloomsbury, W.C. 1.
POST-GRADUATE COURSE: FEBRUARY–MARCH, 1924.

CLINICAL LECTURES AND DEMONSTRATIONS.
MONDAY, Feb. 18th.—2 P.M., Out-patient Clinic: Dr. Hinds-Howell. 3.30 P.M., Epilepsy and Allied Conditions: Dr. James Taylor.
TUESDAY, Feb. 19th.—2 P.M., Out-patient Clinic: Dr. Grainger Stewart. 3.30 P.M., Headaches: Dr. Risien Russell.
THURSDAY, Feb. 21st.—2 P.M., Out-patient Clinic: Dr. Kinnier Wilson. 3.30 P.M., Poliomyelitis: Dr. Gordon Holmes.
FRIDAY, Feb. 22nd.—2 P.M., Out-patient Clinic: Dr. Gordon Holmes. 3.30 P.M., Surgery of Spinal Cord: Mr. Sargent.

COURSE OF LECTURES AND DEMONSTRATIONS ON THE PATHOLOGY OF THE NERVOUS SYSTEM.
MONDAY, Feb. 18th.—12 noon, Neurosyphilis, III.: Dr. J. G. Greenfield.
The fee for the Course, including Pathology, is £5 5*s*. For those who hold Perpetual Tickets the fee is £3 3*s*.

COURSE OF LECTURES ON THE ANATOMY AND PHYSIOLOGY OF THE NERVOUS SYSTEM.
WEDNESDAY, Feb. 20th.—12 noon, Spinal Cord. Reflex Arcs. Automatism.
THURSDAY, Feb. 21st.—12 noon, Medulla and Pons: Dr. Kinnier Wilson.
The fee for this Course will be £2 2*s*.
Dr. F. M. R. Walshe will give A COURSE OF EIGHT CLINICAL DEMONSTRATIONS, CHIEFLY ON METHODS OF EXAMINATION OF THE NERVOUS SYSTEM, in the Wards at 10 A.M., every Wednesday and Thursday during February. The numbers attending the Course will be limited. Fee £2 2*s*.

COURSE OF LECTURES AND DEMONSTRATIONS ON THE NEUROLOGY OF THE EYES.
WEDNESDAY, Feb. 20th.—3.30 P.M., Optic Atrophy: Mr. Leslie Paton.
The fee for this Course alone is £5 5*s*. If taken in conjunction with the general Post-Graduate Course the fee is £3 3*s*. All applications should be sent to the Secretary, Medical School.
Mr. Armour and Mr. Sargent operate at the Hospital on Tuesday and Friday mornings at 9 A.M., or at such other times as may be announced.
Any part of the Course may be taken separately. Special arrangements will be made for those unable to take the whole Course. Fees should be paid to the Secretary of the Hospital at the Office on entering for the Course.
J. G. GREENFIELD, Dean of Medical School.

QUEEN CHARLOTTE'S LYING-IN HOSPITAL, Marylebone-road, N.W.
THURSDAY, Feb. 21st.—5 P.M., Mr. C. White: Delay in the Second Stage of Labour.

ST. JOHN'S HOSPITAL, 49, Leicester-square, W.C.
TUESDAY, Feb. 19th.—5 P.M., Dr. Haldin Davis: Ulcers of the Leg.
THURSDAY.—5 P.M., Dr. Griffith: Pustular Dermatoses.

UNIVERSITY OF LIVERPOOL POST-GRADUATE LECTURES. (At 3.30 P.M.)
MONDAY, Feb. 18th.—(At the Hospital for Women.) Dr. J. E. Gemmell: Pelvic Infection.
TUESDAY.—(At the Maternity Hospital.) Dr. Hendry: Some Points in Ante-natal Work.
WEDNESDAY.—(At the St. Paul's Eye Hospital.) Mr. Hayward-Bywater and Mr. Plummer: Pathological Conditions of the Lens.
THURSDAY.—(At the St. George's Skin Hospital.) Dr. Frank H. Barendt: Skin Cases.

UNIVERSITY OF SHEFFIELD POST-GRADUATE LECTURES.
TUESDAY, Feb. 19th.—(At the Jessop Hospital.) 3.30 P.M., Prof. Phillips: Diagnosis and Treatment of Discharges.
FRIDAY.—(At the Royal Hospital.) 3.30 P.M., Dr. Skinner: Clinical Value of the Wassermann Reaction.

ST. MARY'S HOSPITALS, MANCHESTER, POST-GRADUATE LECTURES (at Whitworth-street West Branch).
FRIDAY, Feb. 22nd.—4.30 P.M., Dr. D. Dougal: Analysis of the Monthly Maternity Report and Remarks on the Treatment of Some of the More Important Obstetric Emergencies.

ANCOATS HOSPITAL LECTURES.
THURSDAY, Feb. 21st.—4.30 P.M., Dr. A. H. Holmes: Late Cardiac Complications of Rheumatism.

MANCHESTER FRENCH HOSPITAL POST-GRADUATE LECTURES.
THURSDAY, Feb. 21st.—4.30 P.M., Mr. R. R. Kerr: Diagnosis and Treatment of Chronic Abdominal Troubles.

MANCHESTER ROYAL INFIRMARY POST-GRADUATE LECTURES.
MONDAY, Feb. 18th.—4.15 P.M., Mr. S. R. Wilson: Recent Improvements in Anæsthesia.
TUESDAY.—4.15 P.M., Mr. E. D. Telford: Lateral Curvature of the Spine in Children.

ROYAL INSTITUTE OF PUBLIC HEALTH, 37, Russell-square, W.C.
WEDNESDAY, Feb. 20th.—4 P.M., Dr. M. S. Paterson: Infectivity of Tuberculosis.

Appointments.

BUTCHER, W. H., M.D., D.P.H. Oxf., has been appointed Assistant Medical Officer, Somerset County Council.

FURNISS, ADA, M.R.C.S., L.R.C.P. Lond., D.P.H. Vict., House Surgeon, Nottingham Children's Hospital.

LEWIS, E. CATHERINE, M.S. Lond., F.R.C.S. Eng., Urologist to the South London Hospital for Women.

Certifying Surgeons under the Factory and Workshop Acts: MACKENNA, L. (Oakengates, Salop); IVES, B. G. (Newark); HETHERINGTON, G. M., M.B., Ch.B. Glasg. (Clackmannan).

Vacancies.

For further information refer to the advertisement columns.

Aberdeen Royal Hospital for Sick Children.—Hon. Asst. S.
Birmingham General Hospital.—Director of V.D. Dept. £600.
Birmingham, Highbury, Uffculme and Sorrento Hospitals.—Med. Supt. £800.
Birmingham, Queen's Hospital.—Med. Reg. £100.
Brighton, New Sussex Hospital, Windlesham-road.—H.S. £50.
Bristol, Cossham Memorial Hospital, Kingswood.—H.S. £150.
Bristol General Hospital.—Two H.P.'s, H.S., Res. Obstet. O., and Cas. H.S. Each £125.
Carlisle, Cumberland Infirmary.—Res. M.O. £175.
Edinburgh Royal Mental Hospital.—Asst. P. £350.
Evelina Hospital for Children, Southwark, S.E.—P. to Out-patients.
Glamorgan County Mental Hospital, Bridgend.—Jun. A.M.O. £350.
Hull Royal Infirmary.—Asst. H.S. £150.
Kensington, Fulham and Chelsea General Hospital, Richmond-road, S.W.—Reg. 20 guineas.
Kent County Ophthalmic Hospital, Maidstone.—H.S. £300.
Liverpool, Alder Hey Hospital for Sick Children.—Res. Asst. M.O.'s. £200.
Liverpool, Mill-road and Brownlow-hill Infirmaries.—Asst. Res. M.O. £200.
Malay States.—M.O.'s. and Health O.'s. £616.
Manchester, Ancoats Hospital.—H.S. £100.
Manchester Corporation.—Asst. Tub. O. £621.
Manchester, St. Mary's Hospitals.—Res. Obstet. S. Res. S.O. Each £200. Also two H.S.'s. Each £50.
Metropolitan Ear, Nose, and Throat Hospital, Fitzroy-square, W.—Asst. S.
Norwood and District Cottage Hospital, Hermitage-road, S.E.—Vacancy on Hon. Med. Staff.
Portsmouth Royal Hospital.—Sen. H.S. £200. Also Asst. H.S. £150.
Portsmouth Workhouse Infirmary.—Asst. R.M.O. £350.
Royal Chest Hospital, City-road, E.C.—P. to Out-patients.
Royal Earlswood Institution, Redhill, Surrey.—Jun. Asst. M.O. £250.
Royal Northern Hospital, Holloway, N.—H.S. £75.
St. Mark's Hospital for Cancer, Fistula, &c., City-road, E.C.—H.S. £200.
St. Pancras Dispensary, 39, Oakley-square, N.W.—Hon. Ophth. S.
St. Thomas's Hospital.—P. Also Ophth. S.
Scarborough Hospital and Dispensary.—H.S. £150.
Scotland General Nursing Council.—Examiners.
Sheffield Royal Hospital.—Surg. Reg. £200.
Southampton, Royal South Hants and Southampton Hospital.—Jun. H.S. £150.
South London Hospital for Women, South Side, Clapham Common, S.W.—Three H.S.'s and one H.P. Each £50.
West London Hospital, Hammersmith-road, W.—Hon. Med. Reg., Hon. Surg. Reg., and Hon. Obstet. Reg.

The Chief Inspector of Factories, Home Office, London, S.W., announces the following vacant appointments: Sherston, Wilts; Bodmin, Cornwall; Thornhill, Dumfries.

Births, Marriages, and Deaths.

BIRTHS.

CAITHNESS.—On Feb. 6th, the wife of Dr. William Caithness, of George-street, Manchester-square, W., of a son.

WHEELER.—On Feb. 4th, at North-street, Rugby, the wife of Dr. J. N. Wheeler, of a daughter.

DEATHS.

CURTIS.—On Feb. 8th, at Alton, Hants, William Curtis, M.R.C.S., L.S.A., aged 87.

NEWTON.—On Feb. 6th, John Newton, M.R.C.S., L.R.C.P., aged 72.

SNELL.—On Feb. 5th, at Cecil-court, London, S.W., George Snell, M.D., late Colonial Medical Service.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Comments, and Abstracts.

A "GRADED FACTORY" FOR TUBERCULOUS PATIENTS AND EX-PATIENTS.

BY C. F. PEDLEY, M.R.C.S. ENG.,
SENIOR RESIDENT MEDICAL OFFICER, WINSLEY SANATORIUM, NEAR BATH.

A SANATORIUM officer is interested in any views of working process on the care and after-care treatment of tuberculosis. In a paper on this subject read by Dr. F. J. H. Coutts at the ninth annual conference of the National Association for the Prevention of Tuberculosis, held at Birmingham in July, 1923, the point most emphasised was that the family of a tuberculosis patient must be taken as the unit in all schemes for care and after-care treatment.

Establishment of Diagnosis.

Probably many hundreds of patients pass through the hands of a sanatorium officer during his term of office, and where the institution is one for pulmonary tuberculosis he will of necessity have to deal with other forms of tuberculosis. In every instance he will have to consider the future of each patient, not only with reference to the individual's health, but also with regard to that individual's niche in the community outside an institution. As all sanatorium officers will acknowledge, all cases which pass through sanatoria are not suffering from tuberculosis, but 90 per cent. of these cases are probably labelled and notified as tuberculosis and are therefore handicapped for life.

In the present state of knowledge—among the general population and, I regret to think, among some members of the medical profession—tuberculosis is looked upon as a fell disease; in the latter case so much so that a patient with a positive sputum and in need of surgical treatment for some other cause is refused treatment in the general wards of a hospital. It is of the utmost importance that a difference should be recognised by everyone between a patient who has received sanatorium treatment for a condition not clearly distinguished and one who has received such treatment because he is suffering from tuberculosis. In many cases it is impossible to diagnose pulmonary tuberculosis at a dispensary or in a home; a patient suspected of pulmonary tuberculosis should be under observation for a length of time before a label is attached to his condition, and this can usually only be done in an institution.

A sanatorium should therefore be used much more frequently than it now is for purposes of diagnosis as well as for treatment of proved cases of tuberculosis; such use is allowed under the Ministry of Health's heading "Cases under Observation." Certificate "A" would not, therefore, be issued, as it so often is at present for every case because the patient is sent to a sanatorium. It makes a great difference to a patient who enters a sanatorium knowing that his case is only under observation, and that he may be passed out as not suffering from tuberculosis.

Definitely Tuberculous Patients.

We thus come to those patients who are definitely suffering with tuberculosis and these alone are the object of care and after-care treatment. To-day a tuberculosis patient after treatment is almost entirely maintained by charity, whether in a colony, on the staff of an institution, or in his home. His outlook is the same for the rest of his life, and there is no incentive to better his position. His labour tends to be exploited, his home goes to pieces, he may have lost his self-reliance, independence, hope; give these back to him and he is a new-made man. The treatment apparently most prevalent in sanatoria throughout this and other countries is the "graded work" system based on the theory of auto-inoculation. It is accepted by most tuberculosis authorities that by this method a person's resistance to active disease can be raised to and maintained at such a level that the individual can live and work for years if his outside circumstances allow it. The goal of all schemes for care and after-care treatment is to make these circumstances favourable, and I wish in this paper to lay the foundation of a plan to overcome the difficulties which surround the life of an ex-tuberculosis patient.

One gathers from Dr. Coutts's paper that much money is devoted by various bodies to the social and individual amelioration of the lives of tuberculosis patients outside an institution, and hardly any one scheme is similar to another. Every patient, whether he has been in a sanatorium or not, is, at the end of his treatment, in one of three classes: (1) fit for work, (2) fit for some work, (3) not fit for work. But a definite tuberculosis patient in Class 1, however fit he is, is never a 100 per cent. man in the world's market. Therefore he, together with his immediate circle, is affected from a social and economic point of view. Much more so

are the greater number of patients who fall in Class 2. I exclude from consideration those patients not fit for any work, as presumably they have "active" disease and still require institutional or hospital treatment. Sanatoria are maintained mostly by State and rate finance, and are usually the centre of the active anti-tuberculosis work in their district, with their patients living somewhere reasonably near.

The Graded Factory.

I would suggest that in an area where a sanatorium has been deemed necessary a "graded factory" should be erected. From a census of the occupations followed by all types of patients on the tuberculosis roll in this area can be formed a very definite idea of the products to be expected from such a factory. All ex-tuberculosis patients are worth a certain percentage in the market; under favourable circumstances every patient can raise his percentage value, as he can on graded work in a sanatorium, after the system laid down by Marcus Paterson. I consider it injurious and unnecessary in the majority of cases that a patient undergoing treatment should give up his occupation and, as usually happens nowadays, be taught a new trade. It is impossible to expect a man of, say, 40 to keep himself let alone a family also. Exceptionally few occupations per se cause tuberculosis; it is always the circumstances which are adverse and cause all the trouble. In my scheme, therefore, an ex-patient would continue his occupation in this factory according to his grade capacity.

The factory, its machinery, shops, and grounds would, of necessity, have to be as hygienic as the dwellings in a colony or sanatorium. As regards percentage of normal work, say an ex-patient bricklayer can do a grade of work worth 40 per cent. of the normal amount. There may be other ex-patient bricklayers, some at 30 per cent., some at 90 per cent.; the percentages can be worked in with one another, so that a 100 per cent. time sheet, and in effect a 100 per cent. value sheet is finally obtained in bricklayers' work in that factory.

It must be fully realised that working under favourable conditions an ex-patient may be worth and able to perform the real 100 per cent., in which case he would receive full market wages. The sole charity which this man accepts is the fact that he is recognised by the community as a "lame dog" in the open market only. His incentive to work is that of a normal man—wage-earning and all that appertains thereto—and he works the better knowing that health is for him the only way to economic independence. The 40 per cent. man can, at least, raise his standard of health and his economic value. In my scheme, while his value is low, he receives material charity to the extent of the difference, in this case 60 per cent.; what is not found for him is the means to escape this 60 per cent. charity and dependence, and to earn his 40 per cent. It is this difference which exists between any present-day scheme in care and after-care treatment and the proposal which I am putting forward, and which I desire to stress. An ex-patient, in my scheme, on entering a graded factory is made a useful and self-supporting member of the community, and set on the road to self-reliance, hope, and independence.

Staffing and Supervision.

In charge of this factory would be (1) a business manager, and (2) a physician well versed in the theory and practice of auto-inoculation—the combination working like a captain and his medical officer in a ship. The ex-patient should be graded by the medical officer, and the manager should set him to work in the correct grade, his time and pay-sheet being allotted accordingly. The manager would make up the quota of work in the factory by interlocking the various percentages. The medical officer would adjudicate the grades by temperature chart and periodical examinations. I would propose that each patient should keep a chart and record his own morning and evening temperature, and that on arrival at and departure from the factory his temperature should also be recorded. Fortnightly or at longer intervals his grade should be raised. If an auto-inoculation or breakdown occur the ex-patient would become an in-patient in his former institution or at home, and, as at present, receive sickness benefit—only instead of having a precarious inducement to leave the institution he would have a very real one—re-admission into the graded factory.

An important point in the scheme is that this factory is central, and therefore work-travel, a serious obstacle in the life of many ex-tuberculosis patients, is practically eliminated. It seems to be the modern tendency of good manufactory houses to have sufficient space around their factory for the recreation of their employees and for the employees to reside in the neighbourhood of parks. Thus an ex-patient also will have a home life and a working life, whatever his occupation, like an ordinary citizen.

By what means can this graded factory be raised and maintained? How have various colonies and sanatoria throughout the country been established? Cannot they one and all come from the same source? Some sanatoria are self-supporting and even make a profit. I do not know any colony that does.

Economic Aspect.

Once established, I consider that this graded factory could be run on a sound economic basis, the products would be on the open market at current prices, and the community would know that there was no exploitation of labour, but would realise, as in institutions for the blind, each ex-patient workman was giving his full percentage worth. The more the ex-patient flourished as a workman, the less would be the calls on charity. Such a scheme embodies a definite and workable plan of management. A graded factory can be maintained by any governing body such as controls our sanatoria, and attains the object of all schemes for care and after-care treatment in tuberculosis—viz., the assurance of work and wages for men, women, and children alike, and the opportunity of maintaining self-respect, self-reliance, and independence. The work of the tuberculosis dispensary would still be of the utmost importance as a clearing house for discharged sanatorium patients. The tuberculosis officer might draft the patient with his sanatorium grade into the graded factory, without loss of time, and the patient, spared the trials of unemployment, would thus be able to work at his own particular trade under sanatorium conditions.

It is obvious that the financial aspect of this scheme will have to be investigated with care by experts, but I am fully convinced that the expenses would not equal a tenth of those involved by a "colony." From the medical and public health point of view I feel assured that the graded factory would supplement the valuable work in the prevention and treatment of tuberculosis done by the sanatoria, the result of which is at present often lost. The ex-patient and his family will gain new hope, and therefore a renewed interest in life.

Note.—I am interested to read in Dr. A. S. MacNalty's article "Tuberculosis Work in England," in THE LANCET, Jan. 26th, a suggestion that there is or will be in Leeds a scheme in care and after-care treatment on some such lines as I have proposed.

PUBLIC HEALTH IN THE CAMEROONS.*

ACCORDING to a report bearing the signature of Lieut.-Colonel H. C. Moorhouse, Lieut.-Governor of the Southern Provinces of Nigeria, based mainly on material supplied by the resident (Major F. H. Ruxton), the Cameroons Province is at present divided into four medical areas, which correspond roughly with the natural features of the country: (1) The sea coast of Victoria and the plantations in the neighbourhood; (2) the hill station of Buea with Kumba; (3) the river plain of the Cross River (Mamfe Division); and (4) the table land area of Bamenda. Medical officers are stationed when available at Bamenda, Mamfe, Buea, and Victoria, with a native dispenser at each station. Each of these areas has its localised diseases and sanitary problems. These are but slightly affected by the ex-German hospital and sanitary arrangements, as the areas which have to be served by the stations are very extensive and the people not advanced in questions of public health. The natural advantages of the country in being for the most part of a mountainous nature with a relatively low temperature and good natural drainage and water-supply counteract many of the evils which would otherwise flourish. In the forest area the soil is mainly clay and natural drainage poor; there is no attempt among the natives to instal any system of soil disposal other than shallow pits scratched in the jungle close to the village, and with no regard to the source of drinking water, which is generally the nearest stream. It is understood that the "street-system" of villages throughout this area was the invention of the Germans for political reasons. A description of a typical village may be of service: A wide road, beaten flat by constant traffic, along which the town extends on either side with as few breaks as possible, to avoid separate walls and roofs in construction of the houses; the length of this street is limited only by the number of inhabitants, and forms a tunnel along which ventilation is only possible in the line of the street; the houses, low and dark, built flimsily of wattle and daub, with poorly thatched roofs,

* The German Protectorate of Kamerun on the west coast of Africa between British Nigeria and French Congo was obtained by conquest by Franco-British forces during the war of 1914–18, and at the conclusion of peace its administration was confided by the Supreme Council of the Allied Powers to Britain and France jointly. The British sphere is a wedge-shaped strip, running with the Nigerian border, and containing an area of about 28,000 square miles. It is administered by the Nigerian Government.

lighted and ventilated as a rule only by a low door at front and back; no shade along the road, which may run for three miles through a village of this type; no trenching in front of or behind the houses and clearing of bush behind, so that all refuse and night soil is deposited a few yards from the dwelling. Cultivation, is as a rule, some distance from the village, so that the latter does not obtain the benefit of cleared and clean ground around it. Throughout the area a common source of income appears to be pig-breeding, these animals being neither fed nor penned, and drawing their food from jungle weeds and village garbage, with free access to either. The staple food of the people is the bulb of the "coco-yam" arum lily, which is a bulky and perishable article of small nutritive value. It is, however, fairly easy of cultivation, though there appear to be large areas where the true yam as well as maize could be grown. Around the food question revolves the vital and vicious circle of infant mortality. This depends on the well-being of the expectant mother, whose status appears to be low in the Cameroons, where all the manual labour of the farm and the house falls to her share. The people themselves are most anxious to seek treatment for their children, who come to the local dispensary in large numbers for medicine, and every case serves as a text for impressing the value of simple measures in feeding and cleanliness, which the parents appreciate. On the other hand, the great majority of the people appear to be chronically underfed and the women overworked while young and neglected when old. The staple diet is inadequate for young children and the sick, who fall an easy prey to such complaints as ulcer, skin diseases, and intestinal parasites. In Bamenda the country possesses great assets in being well drained, with a temperate climate, and in possessing good food supplies. Large quantities of potatoes, introduced by the Germans, are grown by the natives for their own consumption. The water-supply is abundant, and fairly free from contamination, being from mountain streams. The general type of native is sturdy and markedly free from the chronic ailments that are seen in the forest area drained by the Cross River. The system of plantations around Victoria has hitherto employed large numbers of natives (11,000 in August, 1922). These men and boys receive free medical treatment in hospitals, of which there is one on every plantation, with native dressers and attendants under the supervision of the medical officer. There have been no widespread epidemics, and there is a remarkable absence of diseases attributable to the nature of the work. Serious cases can be transferred to hospitals at Buea or Victoria directly under the supervision of the medical officer. Throughout the Cameroons the people have willingly submitted to vaccination and to medical instructions regarding isolation and treatment of infectious cases. Acute cases of bronchial pneumonia occur at the "change of season" from the dry to the wet, and vice versa; the natives attribute this to the effect of the influenza epidemic of 1918. It is probable that the infection of that epidemic will linger for some time, especially in the areas of overcrowding and heaviest rainfall. It is hoped to establish small dressing stations, of the nature of "aid posts," under the direction of the medical officers and staffed by natives sufficiently trained to use simple remedies, who will advise the local inhabitants in sanitary measures. With improved communications it will assuredly be found that not only will the people be able to seek medical advice more freely, but that the freer exchange of commodities will raise the standard of living and increase the food-supply, with the improvement of the health of children. The fact that the birth-rate is low does not appear to be due to venereal disease, few cases of which are seen except in the stations, where they appear to be imported, and do not go with a system of professional prostitution. Promiscuous relations seem generally due to the inability of the man to pay the dower asked for a girl, who may therefore decide to live with her "friend" for a period, depending on his whim or means. As such union gives her no claim on the children, the discarded woman has to find another refuge, having no independent means. The practice of holding the children of a marriage in bond to the woman's parent until the whole dower is paid has also an adverse effect on the increase of families, and as the man in a position to afford several wives is usually elderly there are few children in proportion born to him, with the added disadvantage that the offspring of the young and healthy women of a village may be nearly related by blood. Throughout the Cameroons the natives avail themselves willingly of medical advice and treatment, and appreciate the superiority of European methods to their own, though, as elsewhere, they often delay coming to hospital until their own methods have proved unavailing, and are disappointed that the white man's cure is not more swift and spectacular. For this reason the majority of patients who are willing to undergo prolonged treatment in Government hospitals are surgical rather than medical cases.

FOOD POISONING AMONG ANIMALS.

DOMESTIC animals seem less able to discriminate between good and harmful diet than do wild animals. When the farmyard stock is out at pasture, and particularly in the spring after the long winter months of dry fodder, the succulent green of the meadows overcomes old instincts, and poisonous vegetation is consumed undetected. In this way, such toxic substances as ragwort, horse-tail, yew, laurel, and laburnum are often eaten. Poisoning among animals is dealt with at length in the January and February issues of *Veterinary Journal*. The ingestion of poisons may be accidental, through ignorant administration of dangerous drugs, or through the animal consuming some so-called harmless rat-poison. Poison may be present as an adulterant of certain prepared foodstuffs, or may be due to vegetable, animal, or mineral contamination of the drinking water.

Many sick animals are treated by their owners with overdoses of potent medicaments or with quack preparations of a harmful nature, and G. W. Clough, D.Sc., of the Royal Veterinary College, London, cites some interesting cases of fatalities in sheep, goats, pigs, and dogs from the use of proprietary medicines which contained poisonous drugs in over large proportions. As examples of food adulterants which not infrequently cause death, mention is made of excessive amounts of salt in fresh meat, castor beans in cake, and barium carbonate in sharps. In parts of the country situated near lead-mining districts deaths frequently occur in horses, cattle, sheep, dogs, cats, and poultry from lead poisoning, and many accounts of cases and the post-mortem symptoms are given. The streams that run away from lead mines over the surrounding country are especially dangerous for watering stock. Malicious poisoning forms another category. Students of toxicology will find much that is interesting and instructive in these two issues of *Veterinary Journal*. The cases of poisoning that veterinary surgeons meet with are numerous and varied, and the experiences recorded are worth reading by those who take more than a passing interest in the subject.

THE HYGIENE OF THE COMMUNION CUP.

WE have received a pamphlet bearing the above title, written by Dr. W. H. Read, and published in Sydney by the *Christian World*. The pamphlet deals with two questions: Is there danger of infection from the use of a common cup at the administration of the Holy Communion? and Should each several communicant have his own private cup? We have dealt with these problems from the medical point of view upon several previous occasions [1] and we can but repeat our opinion. The use of the common cup may transmit disease, although the risk is but slight except in places where a number of obviously tuberculous communicants are present. The only methods of avoiding such risk are: (1) the communicating the laity in only one kind; (2) the use of the form of communication known as intinction; and (3) the use of individual cups. Of these three methods (1) is allowed by the Roman Church, which employs it, to be contrary to primitive practice; (2) is objected to by one school of thought as being contrary to the command "Drink ye all of this"; and (3) is objectionable to our mind on account of the difficulty of providing for the proper cleansing of the cups. Despite the opinion of the Rev. F. W. Reeve, who writes on p. 28 of the pamphlet that "the only objections met with are from extreme ritualists, who would be unable to perform certain ablations (sic) quite unauthorised by the Prayer-book," we can assure him that the question of proper cleansing (for we imagine that the reverend gentleman means "ablutions" when he writes of "oblations") is a serious matter to many others than extreme ritualists. Intinction therefore seems to us the best way out of the difficulty. It is primitive, it is decent, and reverent, and we would commend to the notice of those who object that the method minimises the command "drink" the following point, namely, that the two Evangelists, St. Matthew and St. Mark, in their account of the crucifixion, when describing the giving of the sponge dipped in sour wine to Christ on the cross, both use the word *ἐπότιζεν*—i.e., "gave him to drink."

THE TEMPERANCE REFORMER'S HANDBOOK.

IN the Alliance Year Book and Temperance Reformer's Handbook for 1924 (London: U.K. Alliance and Headley Brothers, pp. 269, 2*s*.), many aspects of the problem of alcohol are considered from the point of view of those who, in their own words, "were satisfied that the history and results of past dealing with the liquor traffic in all lands had abundantly proved that it was impossible satisfactorily to limit or regulate a system so *essentially mischievous*." A foreword contains a brief account of the United Kingdom Alliance and of its activities—which, as is well known, are political rather than religious—from the foundation of the organisation in 1853 to the present day. Messrs. B. S.

[1] THE LANCET, 1900, ii., 1088 and 1364; 1903, i., 1186; and 1909, i., 1698.

Spence and H. A. Job contribute articles on the temperance position in Canada and Australasia respectively. Sir Auckland Geddes's memorandum on American Prohibition is very interesting, not least because he has tabulated side by side the statistical conclusions relating to the effect of the Volstead Act (passed in October, 1919) from three sources: (1) the Anti-Saloon League, (2) the Association against the Prohibition Amendment, and (3) the Federal Prohibition Unit of the United States Treasury. The enormous discrepancies in these comparative figures explain the confused echoes which arise in this connexion on our side of the Atlantic. Thus the number of arrests for drunkenness on a 100 per cent. basis of the number in a given time during the period before prohibition is put at 50 by the League, at "fully 100" by the Association, and at 50 by the Treasury Unit. The figures of deaths from alcoholism, similarly compared, are given as 20, 250, and 20 per cent. respectively; and other supposedly carefully-compiled statistics show similar differences. Sir Auckland Geddes also notes that since the adoption of prohibition a large increase—computed at 40 per cent.—has taken place in the amount of deposits in savings banks; the claim that prohibition has increased production in the factories and has bettered the home conditions of the average wage-earner is, perhaps, rather lightly dismissed, with the comment that "so many other factors have contributed to restore economic conditions in the United States since the war that it is almost impossible to form any estimate of the extent to which prohibition has contributed to this recovery, or otherwise." In an article apparently reprinted from the New York *Outlook*, Mr. Raymond Spears writes of "The Furtiveness of Liquor," and makes the following statement: "I can walk the streets of my town and not see ten drunks in six months, when in half an hour before prohibition came I saw and counted thirty-odd in 15 minutes. And, with my eyes open, I drive tens of thousands of miles and see no drunken men, and the pitiful dejection or recklessness that is the mark of illicit liquor on property and community and individual appears only at long intervals, and one must know it to recognise the sign." Another interesting feature of the Year Book is a series of "pictorial studies in temperance economics," or posters issued by the Alliance in leaflet form for propaganda purposes. The full text of the Intoxicating Liquor (Sale to Persons under Eighteen) Act, 1923, is also included. The usual full index facilitates reference.

A USEFUL HYPODERMIC OUTFIT.

Dr. John W. Tomb, medical officer of health, Asansol Mines Board of Health, Bengal, sends us the following description of a useful and compact hypodermic outfit which he has used in India for over ten years under all conditions of transport. He writes: "The universal use of hypodermic medication necessitates the possession of an outfit which will secure the minimum waste of time in its employment with the maximum of surgical sterility. The hypodermic outfits sold by the large manufacturing houses are costly and require very considerable care in transport. I claim for the outfit here described that it is cheap and always ready for use. It consists primarily of a three-piece 60-minim B. & W.'s all glass hypodermic syringe, with a platino-iridium needle, size No. 27. The syringe when originally assembled is sterilised by boiling in its metal case and is *never afterwards taken apart*. The platino-iridium needle is also originally sterilised by boiling but on all subsequent occasions is sterilised by heating in the flame immediately before and after use. As an additional security against contamination, and to preserve the point against injury, the needle is kept in an empty sterilised hypodermic tabloid glass phial of suitable size with the point of the needle directed upwards and embedded in the cork, a pledget of sterilised cotton-wool being placed at the bottom of the phial. The "lamp" consists of an ordinary 2 oz. glass-stoppered narrow-necked bottle filled with methylated spirit and provided with a separate (locally made) brass or other "burner" with a wick of twisted cotton strands. To wash out the syringe after use and at the same time to sterilise it and to maintain it constantly in sterilised condition, and also to prevent the glass piston from sticking to the barrel, a mixture of equal parts of glycerine, carbolic acid, and rectified spirit is provided in a ½ oz. glass-stoppered bottle. The needle having been previously sterilised in the flame, five to six minims of this mixture are drawn into the barrel of the syringe on each occasion after use. The piston is then gradually withdrawn while holding the nozzle of the syringe upwards, so as to allow the mixture to escape and at the same time thoroughly to wash it out and lubricate the whole barrel, the piston being subsequently replaced. A small teaspoon is included in the outfit in which to dissolve the hypodermic tablets by boiling, and thus secure that none but sterilised solutions shall at any time be taken into the barrel of the syringe. In the tropics it is often desirable to assist the cooling of the sterilised hypodermic solutions by immersing the tea-spoon to half its depth in a little cold water in a saucer or other suitable vessel. Not more than 60 seconds are required for this operation.

The whole outfit is contained in a stout cardboard box, 7½" long by 4" broad by 2½" deep, with a cover of the same material. The box is half filled with cotton-wool to absorb shocks and to protect the contents from injury. As an additional protection a layer of corrugated cardboard is also fitted around the inside of the box on all sides, and at the top."

THE GLASGOW ROYAL INFIRMARY.

AT the annual general Court of Contributors of the Glasgow Royal Infirmary, held on Feb. 11th, the report by the managers for 1923 was submitted. The work of the infirmary has increased considerably during the past year. Beginning the year with 653 in-patients, the total treated in the wards during the 12 months numbered 12,759, being an increase of 1397 on the previous year. There were on occasion no fewer than 789 patients in the house at one time, the daily average number resident being 722·9, and the average period of residence 20·7 days. In view of the large numbers waiting admission, some overcrowding was unavoidable. The number remaining on Dec. 31st was 672. Similarly an increased volume of work was carried on in the out-patient department, where 48,693 patients, being 4004 in excess of the number in 1922, attended for advice and treatment, while the total number of attendances was 220,193, as compared with 188,532. At the ophthalmic institution 855 in-patients and 13,541 out-patients were treated. At the Schaw Home, Bearsden, 1041 persons were received as convalescent patients. One outstanding feature has been the introduction to the infirmary of the treatment of diabetes by insulin. Since February last diabetes has been treated with insulin at the infirmary with satisfactory results, but the investigations are not complete, and are being continued. The Royal Infirmary has not a bio-chemical laboratory, and special arrangements were made to supply the need, but with the help of some friends the necessary funds were raised so that the infirmary funds were not called upon to defray any of the expenses of this investigation. As soon, however, as the experimental stage was past, the managers decided that the cost of insulin should be borne by the infirmary. The managers apprehend that another addition to expenses must soon be made by establishing a bio-chemical department, to aid not only in the actual treatment of the patients, but also in the investigation of those diseases which are due to faulty metabolism. In view of the widespread stagnation of trade and increased difficulties due to unemployment and other causes, it is matter for congratulation, the report states, that the financial year terminated satisfactorily. The total amount received from all sources exceeded the sum for the previous year. On the other hand, expenditure rather increased. To equip the infirmary adequately to meet modern demands and developments in all departments of medicine and surgery, a large fresh expenditure will also be necessary. Subscriptions from employees and others were generous, though slightly less than in the previous year. The widening of the scheme for organised weekly contributions in works, warehouses, &c., continues to bring in new and increased subscriptions. The ordinary expenditure of £107,686 was £2873 more than in the previous year, and the ordinary revenue amounted to the sum of £82,976—a deficiency of £24,710. There were received during the year the sums of £21,224 in legacies, and £11,200 by way of donations. These sums were drawn upon for extraordinary expenditure of £1301 and to meet the above deficiency of £24,710 on ordinary revenue account. In the final result there is a surplus of £8413.

One Who Believes, &c.—A letter has been received on the subject of an Osteopathic Directory, which can only be inserted if the author entrusts us with his or her name and address.

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